COAL AGE

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When you handle machinery, you scheme and contrive. You don't permit yourself to believe the machine is wrong. "It's strange," you remark, "I can't make it work. I must have got it geehawed somehow,"—and the monkey-wrench gets busy again.

For you know you're responsible if you can't get out of it what the manufacturer purposed.

But when you deal with men, you blame them if you fail to get results. Every time you are confronted with a difficulty and find society is put together wrong, you forget that you may have misplaced or lost some of the parts in your assembling of the operating machine. In short, you moralize when you should contrive.

So many people are apt to think the personal problem in mining an unimportant matter as it is not an engineering question. But the curbs on human conduct are more subtle and just as important as the governor on an engine.

Perhaps the cause of most of the present unrest is the lack of thrift. You permit your mining town to exist without a bank; you arrange matters so that the miners *need* not and sometimes *can not* own any real estate; you place no safe investments in their way and then, by some fortune of business, there is a slack time or a strike and the flow of coin and credit gets a sudden setback.

Those who have never known either starvation or cold do not know what unreasoning things these are. We cannot expect reason when the bread bin is empty, and the operator will find John much more reasonable if he has a home or a bank account at his back, for propertied men understand each other.

The gang politician who steals the paltry pennies of the poor never fails to square himself by liberality in shoes, food and even comforts when the winter comes. A larger crowd follows a Tammany leader to the grave than will ever gather round the bier of the most severely moral of operators, and this true solely because, however predatory the political bosses may be in prosperity, they are good friends of the poor in the cold days of adversity.

The evil movements now in existence are the outcome of the lack of thrift. If we meet present conditions with the statement that we have paid good wages, given the men good homes, allowed them honest weight, shown no favors, charged equitable prices at the store, we have perhaps placed ourselves where no ethical charge can be sustained. But our mines are not run to attest our morals and if we cannot reach the miner and make him take care of himself, either through the public school, the church, the amusement hall, or some other way, we have failed as managers and we are not what we might be as citizens.

Wages are too frequently the workman's sole aim, but we must pay as much attention to his needs as to his aims. Some of us have lived in mining towns where work was steady, cars plentiful, wages standard and the coal not hard, and heard it titled "starvation camp," and all because most of the money earned went for beer, and empty kegs littered every gulley.

Emile Zola in "Germinal" depicts the French coal miners receiving a wage which will barely keep soul and body together; nevertheless Maheu and his mates traveled to the village inn and spent two-thirds of their meager monthly pay in conviviality. In fact the less money one has to receive, whether by reason of unthrift, laziness or poor pay, the more need there is for a narcotic and sedative to shut unpleasant thoughts from the mind.

Do not blindly, therefore, relieve your mind by declaring that the miner who drinks brings these burdens and sorrows on himself. The fault is his but you are not concerned with faults but with their effects. The drunkard arouses discontent and causes antagonisms and misrepresentations which soon end in strikes and property loss. So your more rational way is to endeavor to remove drunkenness and unthrift by any one of a half dozen ways and it is a folly to feel satisfied when the only remedy you try is to deplore idly the weaknesses of human nature.

Safety in West Virginia

By Frank H. Kneeland

SYNOPSIS—A sequel to article under the same caption printed in our issue of Feb. 7. The four basic practices which have done most toward eliminating accidents from the mines of the United States Coal & Coke Co. are here described.

In a previous article, under the above caption, printed in our issue of Feb. 7, we described some of the devices and practices employed by the United States Coal & Coke Co., of Gary, W. Va., to prevent accidents upon the surface, mainly from machinery. The present article will deal with accident prevention underground.

Fig. 1. A Drift Mouth. Note Check Board and Steel Gate

It is conservative to say that much of the great success attained by this company in underground safety has been due to four practices or methods of procedure. These are:

1. The employment of assistant mine foremen.
2. The adoption of a premium system to encourage the foremen and assistant foremen to be constantly on the lookout for danger and dangerous practices and to see that the rules of the company are thoroughly and efficiently carried out.
3. Systematic timbering.
4. Adherence to standard methods in laying tracks, bonding rails, hanging trolley wires and feeder cable, and the like.

It is the practice of this company to employ an assistant mine foreman for each 25 to 35 miners, this number depending upon the condition and layout of the mine. This enables the assistant foreman to visit each working place at least once every three hours during the day. He has, therefore, in case he sees any dangerous place, or the necessity for setting a post, or anything else of a perilous character, ample time to not only instruct the workmen what to do and how to do it, but can remain until the post is set or the dangerous condition rectified.

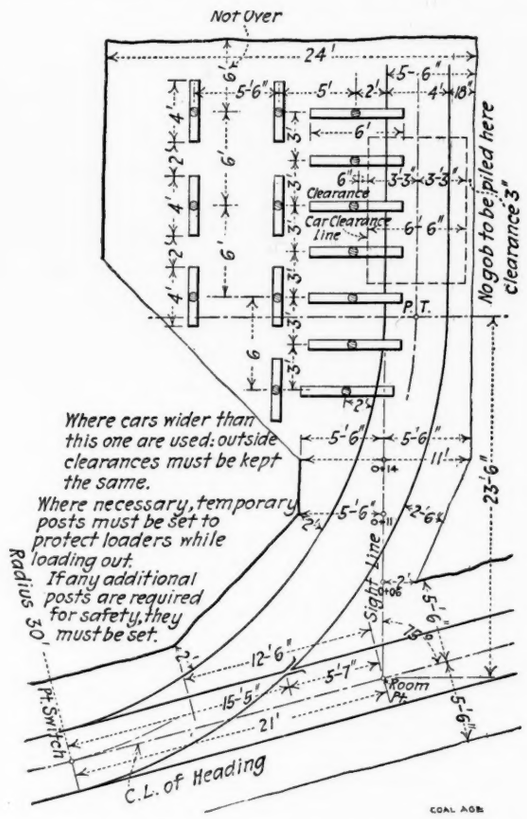


Fig. 3. The Method of Systematic Timbering Adopted

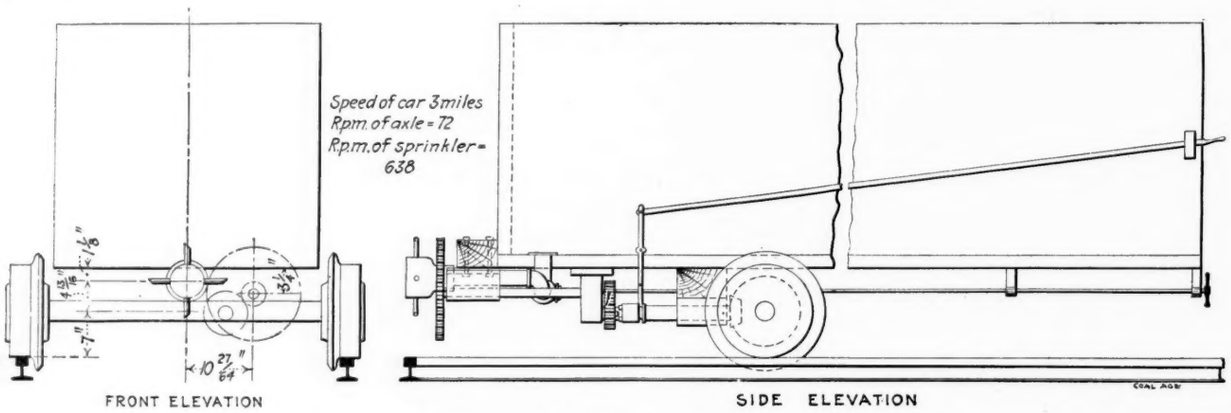


Fig. 2. A Sprinkler Car for Wetting Down Headings

Each Subforeman Has an Instruction Book

To each mine foreman and assistant mine foreman, the company furnishes a book of instructions which he is supposed to carry at all times. This book contains a set of operating rules, together with necessary drawings to explain how work is to be done. A few of these rules are here quoted, the number preceding each being its number in the book:

1. The last breakthrough of every pair of headings, whether working or not, must have at least 12,000 cu.ft. of air per min. passing through it.

3. Assistant foremen must examine each working place in their district, and mark each place visited with date of month before allowing men to enter them. Each idle place must also be examined each day and a record of the examination must be made daily in the book provided for this purpose.

5. When the fan has been stopped for one hour or more, for any reason, all places must be thoroughly examined by assistant foremen before allowing men to enter them and a record of the examination must be made in the record book.

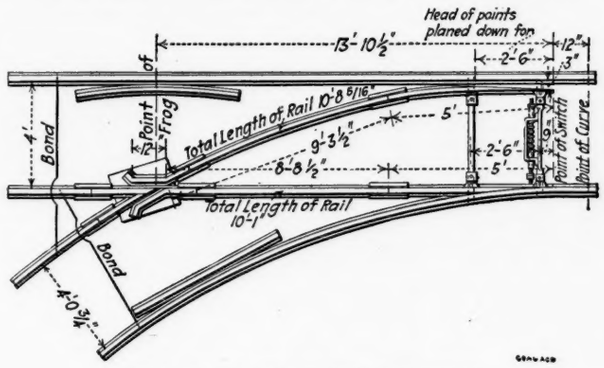


Fig. 4. A Standard Turnout

6. All permanent brattices must be built of incombustible material, concrete preferred.

9. Air measurements must be made weekly and be recorded in the book provided for that purpose.

11. Assistant foremen must carry Pieler testing lamps when making examinations, and all final tests for gas must be made with this lamp. When an ordinary safety lamp will not detect gas, try the Pieler lamp.

12. The presence of dust, as well as gas, must be noted in the record book.

13. Dust must not be allowed to accumulate in working places nor anywhere in the mine.

14. All dusty places on haulage roads must be sprinkled daily.

31. No charge of any explosive in any hole shall exceed 2 lb.

36. Assistant foremen must not fire any shot that is improperly drilled, drilled on the solid, or improperly tamped.

37. Assistant foreman must not fire any shot within three hours after detecting gas in any place in his district.

38. Where more than one shot is to be fired in any place, one shot only shall be charged, tamped and fired, and an examination of the place must be made before firing the second or following shots. Only one shot shall be fired at a time. Assistant foremen must carefully examine working places after shooting before allowing work to begin.

39. No explosives except flameless explosives approved by the U. S. Bureau of Mines shall be used.

43. If necessary, water dust at working face before shooting.

46. Shots must be fired by battery and not from machine or trolley wire.

64. All haulage roads on which more than one car is hauled per trip shall be at least 5 ft. high above the rail, and there shall be at least 2½-ft. clearance between any part of a car, and the side of the heading at all places.

68. All rash, slate, etc., is to be kept cleaned off haulage roads.

72. Permanent track must be bonded as it is laid.

81. Where any dangerous slate is found, assistant foreman must take it down at once before work is done near it or anyone or any trip allowed to pass under it.

82. Loaders must post their working places. Proper arrangement and placing of caps, posts, etc., is shown on standard plan attached (see Fig. 3), which must be strictly followed. Posts must be set in straight lines and be vertical. Cap pieces must be wedged tightly against roof with wedge between post and cap.

83. Assistant foremen must not O. K. nor allow any place to be cut where posts are more than 6 ft. from the face at the bottom.

85. No permanent timbering will be allowed on haulage roads unless under special instructions from general superintendent.

88. Loaders must clean up slate falls in their working places, and must be paid extra for this work.

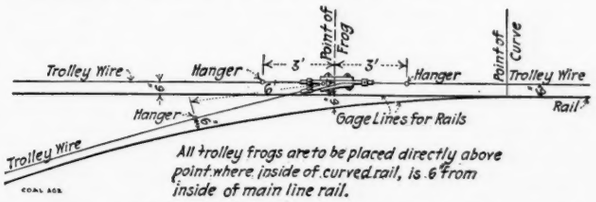


Fig. 5. Trolley-Wire Support at a Turnout

101. The general arrangement of hangers, etc., for trolley wire is shown on accompanying plans (see Figs. 5, 6, 7 and 8), which must be strictly followed.

102. Trolley wire must be hung 6 in. outside of rail and must be as nearly parallel to it, both horizontally and vertically, as it can be.

109. Feeder cables must be supported at intervals of 20 ft. on barn hangers and special "Gem" insulators. Cables are to be placed 12 in. outside of trolley lines, and must be connected to them at intervals of 200 ft. Cables must be properly dead ended with cable clamps and insulated turnbuckles.

113. All insulated cables and wires must be kept free from grounds, same as bare wires.

122. All men must be checked in and out of the mine each day.

125. All work excepting such repairs as cannot be done while operating or at night must be suspended on Sundays.

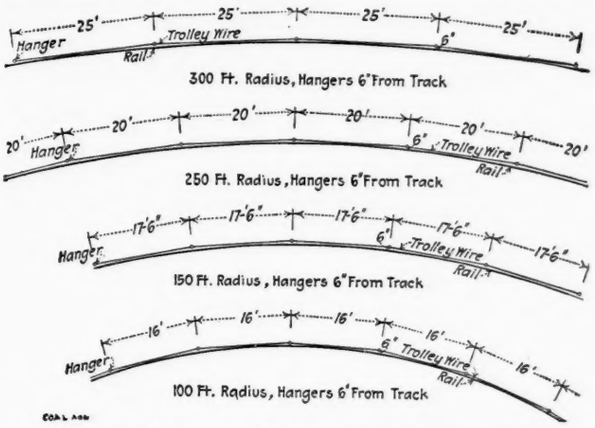


Fig. 6. Trolley-Wire Supports on Curves

130. No machinery of any kind must be allowed to operate unless all gears and dangerous portions are fully guarded.

This book of rules with which each subforeman is provided is intended to supplement the mine law and the posted rules of the company. Printed conspicuously upon its cover is the admonition: "In all work consider first, safety; second, quality; third, cost."

Premiums Are Awarded for No Accidents

Since May, 1909, premiums have been awarded to mine foremen and assistant foremen monthly for the prevention of accidents to employees. These are given upon a merit and demerit basis, the system adopted being as follows:

Qualifications

1. No man shall be eligible for a premium for any month

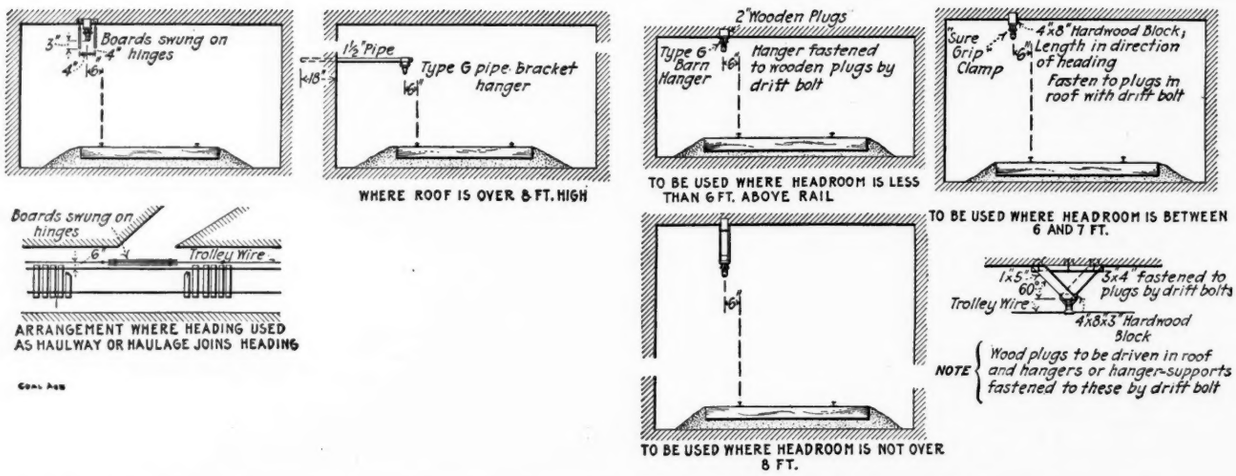

Boards swung on hinges
Trolley Wire
ARRANGEMENT WHERE HEADING USED AS HAULWAY OR HAULAGE JOINS HEADING
1½" Pipe
Type G pipe bracket hanger
WHERE ROOF IS OVER 8 FT. HIGH
2" Wooden Plugs
Type 6 Barn Hanger
Hanger fastened to wooden plugs by drift bolt
TO BE USED WHERE HEADROOM IS LESS THAN 6 FT. ABOVE RAIL
Sure Grip Clamp
4"x8" Hardwood Block; Length in direction of heading
Fasten to plugs in roof with drift bolt
TO BE USED WHERE HEADROOM IS BETWEEN 6 AND 7 FT.
1"x5"
60°
3"x4" fastened to plugs by drift bolts
Trolley Wire
4"x8"x3" Hardwood Block
NOTE
Wood plugs to be driven in roof and hangers or hanger-supports fastened to these by drift bolt
TO BE USED WHERE HEADROOM IS NOT OVER 8 FT.

FIG. 7. VARIOUS METHODS OF SUPPORTING THE TROLLEY WIRE, DEPENDING ON THE HEIGHT OF THE ROOF

in any position who has not worked in that position every working day during the month excepting one, unless he shall have been promoted during the month from one position to another, and is eligible in both.

Explanation—It has been a custom throughout this section of the country for men to not work regularly, and as a number of accidents occur, due to the absence of the regular foremen and the substitution of new men. This qualification has been inserted with a view of inducing men to work regularly and thereby assisting in the prevention of accidents.

2. His work must be satisfactory to his immediate superior, and if it is not, his superior has a right to charge him with demerits to the extent of 10 per month.

Explanation—This qualification is inserted as a means of discipline, since, in a number of instances, some of the assistant foremen do not take sufficient interest in the prevention of accidents to attend the weekly meetings of the officials for discussion and investigation of those accidents which occur.

3. This premium is not considered as a part of the assistant foreman's or foremen's wages, but is strictly in the nature of an award or a gratuity for faithful services rendered the company.

Distribution

1. Each foreman or assistant foreman is charged demerits for each man who is injured under his supervision each month at the rate of 10 demerits for each minor, 20 demerits for each serious, and 40 demerits for each fatal accident.

2. Any foreman or assistant foreman who does not have any accidents under him during any month is given a credit of five merits, which will go toward reducing the number of demerits standing against him until all such are wiped out, when he will not be given further merits until he again receives demerits. No accidents in which the victim loses less than seven days will be considered.

Explanation—It is not considered advisable to allow a man to accumulate merits, as this would have a tendency after he had secured a considerable number to cause him to be less careful.

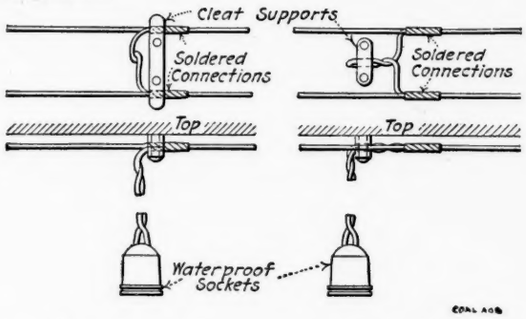


FIG. 9. METHOD OF HANGING LAMPS IN DAMP PLACES

3. Any assistant foremen in whose section the company's mine inspector finds any dangerous practices or conditions which might cause accidents will be charged five demerits for each visit he makes and finds such conditions. If he finds a section to be O. K. and no dangerous practices or condition, the assistant mine foremen will be given a credit of five merits.

Explanation—This provision is made, since it is often the case, that accidents occur for which the assistant foreman

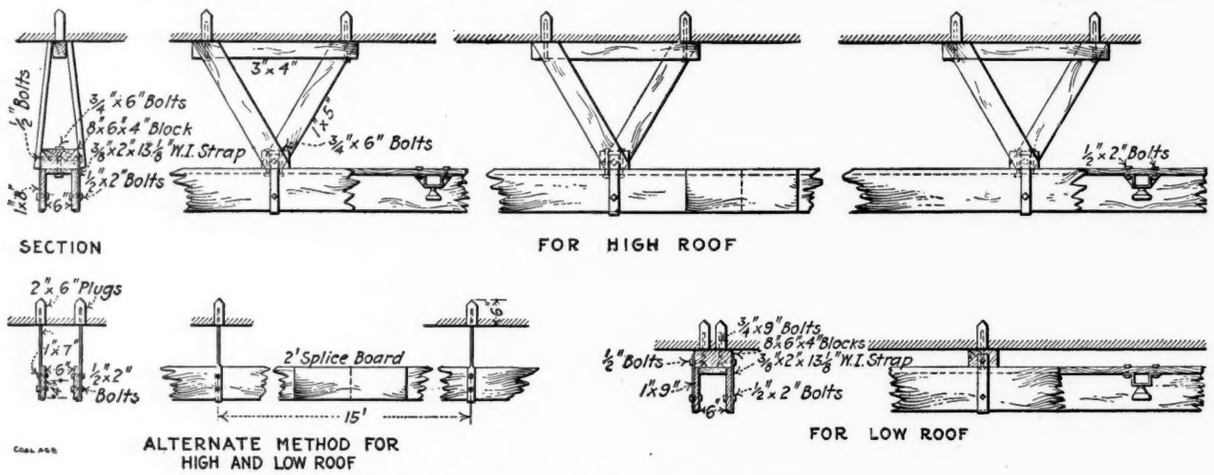


FIG. 8. DETAILS OF TROLLEY-WIRE SUPPORTS AND BOARD GUARDS

is not directly responsible. His place might be as safe as it is possible to make it, but through carelessness on the part of one of his workmen, an accident might occur over which he would have no control. In order to aid an assistant foreman who has been so unfortunate as to have an accident of this kind to get back into good standing, it has been provided that five merits be given him if his place is kept in a safe condition.

On the other hand, an assistant foreman might permit dangerous conditions and practices in his section and still be fortunate enough not to have an accident, due not to any special care or attention on his part. It is therefore, provided that such assistant foremen be given five demerits for the condition of his section.

4. The foreman's account will be charged with all demerits and credited with all merits of the assistant foremen under him, excepting when demerits are given for neglect of duty or for cases other than accidents.

5. No person who has 10 or more demerits to his dis-

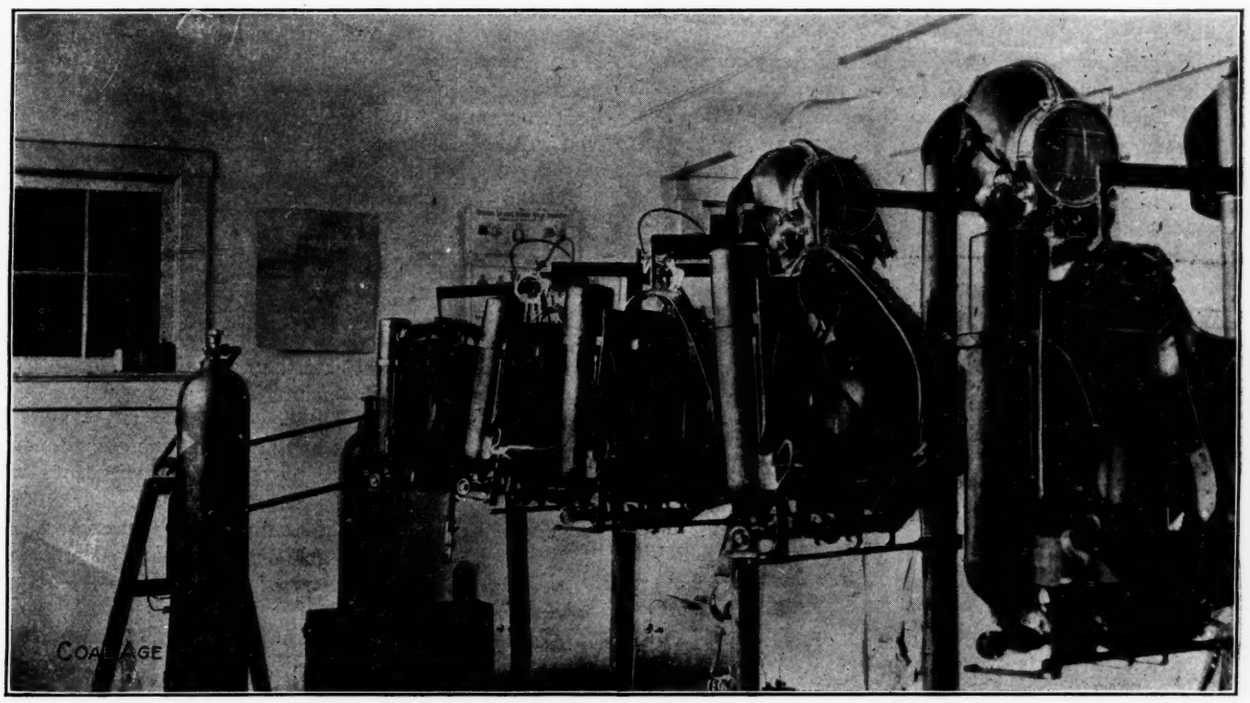


FIG. 10. OXYGEN BREATHING APPARATUS IN TRAINING STATION. WINDOW AT EXTREME LEFT IS IN SMOKE ROOM

credit at the end of each month shall be entitled to any premium, but if he has less than 10 demerits he shall receive a premium of $5 for the assistant foreman and $10 for the foreman.

6. Any mine foreman or assistant foreman who for six consecutive months is entitled to the monthly premium of $10 or $5 under the present rule will at the end of the six months receive a special premium of $15 or $10 and for each month thereafter so long as his record is up to the requirement under the rules, but if his record does not come up to the requirement under the present rules, he will have to again make a clear record for another six months before he is again entitled to a special premium.

7. The assistant foremen and foremen have it distinctly pointed out to them by their immediate superior what men or jobs are under their supervision.

8. If a foreman or assistant foreman leaves the employ of the company and later reënters it, he assumes all demerits charged against him when he left the employ.

Since the adoption of the premium system as above outlined, in May, 1909, the company has paid over 2300 premiums to its officials, amounting in the aggregate to approximately $16,000.

PROPS ARE SET SYSTEMATICALLY

The method of systematic timbering adopted by this company and practiced throughout all its mines is that shown in Fig. 3 and referred to in Rule 82 of the book of instructions above quoted. This system requires that posts be set 3 ft. on centers on roadways with 6 ft. cap pieces turned at right angles to the track. The back rows of posts are set 5 ft. and 5½ ft. from the front row and on 6-ft. centers with cap pieces placed parallel with the road and 4 ft. in length. This system requires three rows of posts in all places over 18 ft. wide. Posts must be kept within 6 ft. of the coal that is being worked at all times, and where conditions are bad, posts are required to be set even closer.

The management is of the opinion that while it may not be necessary for timbers to be set in this manner in some instances in order to support the slate, yet it is preferred to err on the side of safety. It is felt that if the number and position of props were left to the judgment of the workmen as well as the time of setting posts that the latter would not be placed where or when they should be and many accidents would result.

This company maintains a rescue training station, well provided with oxygen helmets, mouth-breathing apparatus, pulmotors, etc. A number of teams of men have been thoroughly trained in the use of this apparatus. Thus far, however, there have been no accidents at these mines requiring the use of helmets and only upon a very few occasions has a pulmotor been called into use in the treatment of electric shock.

RESULTS AND EXPECTATIONS

During the past four years, or since the energetic campaign for safety was begun, there has been a steady and continuous decline in the accidents occuring. Reckoned upon a tonnage basis, fatalities have declined on the average from one for each 100,000 tons to one for each 400,000 tons of coal produced, while during the first three months of 1913, there were no fatalities at any of the 12

mines operated by this company, and something over a million tons of coal were produced and shipped.

In spite of all the precautions taken, however, in spite of the care exercised, in spite of constant vigilance, accidents still occur—men still needlessly lose their lives in the mines. By far the greater majority of these, however, may be traced to lapses of discipline or errors in judgment on the part of someone in authority—in nine cases out of ten, it is a case of where "somebody blundered."

Each fatality, however, carries its own lesson and the knowledge thus dearly acquired is utilized in future accident prevention.

The management of the United States Coal & Coke Co., while feeling keenly that the progress thus far made is not what it should have been, is, nevertheless, thoroughly satisfied that the right course is being pursued. The rules adopted and the methods of protecting dangerous places both above and below ground leave apparently but little room for improvement. It is, therefore, recognized that future progress toward greater security must be largely attained through the mental attitude of the workmen, through closer adherence to discipline, through the exercise of greater discretion, through better habits of thought and action—in short, through better morale.

Drawing Out the Latent Powers of Mine Employees

By Southern Manager

There are plenty of mine managers and mine superintendents who seem to think that "Josh Billings" made a hit when he penned the following: "A puppy plays with every pup he meets, but an old dog has few associates."

We'll admit that when it is artistically printed, suitably illustrated and handsomely framed, the above saying looks ornamental above the boss' desk, but in our humble opinion it has more sound than sense.

Most every mining camp contains men who have been to the far corners of the globe, not only North, South, East and West, but above and below the crust, and in passing hither and yonder, they have "hob-nobbed" with all nationalities and tried their hands at all sorts of occupations. Seems like they ought to be interesting talkers, to say the least.

We once heard a superintendent remark that his men talked so much on Monday nights, while attending their weekly Union meetings, that they remained in a state of coma, the balance of the week.

Had he gone a little further with his investigations, he would probably have found that during the balance of the week, not one of these men could find a willing listener, unless he was a frequenter of the nearby saloon.

Every human being is susceptible to flattery (nothing personal in this, of course), and the most seductive, all satisfying flattery is that brand which suggests that the flattered one is "some pumpkins" in the world's vegetable garden.

We were once present when a Catholic Sister visited a mining camp for the purpose of soliciting funds for a much-needed hospital addition in a nearby city. During her first day's canvass, she happened to draw into conversation a miner who had always been considered the most uninteresting fellow in the camp. It developed that he had once been a zealous Catholic, and in his travels about the world, had picked up knowledge about the Catholic church, historical and cyclopedic, that amazed even the Catholic Sister. From that time forward, this man naturally became the authority on matters pertaining to his church, and it was not long before he became the most aggressive church leader imaginable.

While this may not be a typical example, it unquestionably suggests the possibilities that await any camp that will exert itself to draw out and utilize the experience and latent powers of its inhabitants. Why most any so-called frivolous society girl, from a nearby city, visiting in a mining camp, can get a crowd of your miners into conversation and by her enthusiastic interest in their tales and experiences, she will send them home bristling with their own importance. It's even possible that some of the bosses with the "puppy" motto above their desks might get a few pointers from their men, if they would condescend to a little sympathetic association.

If you are still inclined to be doubtful and pessimistic, you will at least agree with us that:

"Flattery is the bridle and saddle with which you may drive the vain man," and "Vanity! all is vanity."

Profits in Mining Coal in Canada

The commission appointed by the government of British Columbia to investigate the coal-mining industry has issued its report, and touching on the prosperity of coal owners in British Columbia, it states: "There is no unreasonable profit in any branch of the coal industry. Dividends have been paid by only three companies, and these have not in any case averaged more than 10 per cent. covering the period the mines have been operated.

Here again is indisputable evidence that coal mining is the one great basic industry of the world in which there is a minimum return for the money invested and the effort expended. Sometimes our misfortunes are blessings in disguise, and if the bituminous coal owners are unable to pile up huge fortunes, they can at least conduct their business in a modest way, without being forever harassed by federal attorneys.

A Filing Cabinet for Rolled Tracings

By R. S. Wallis

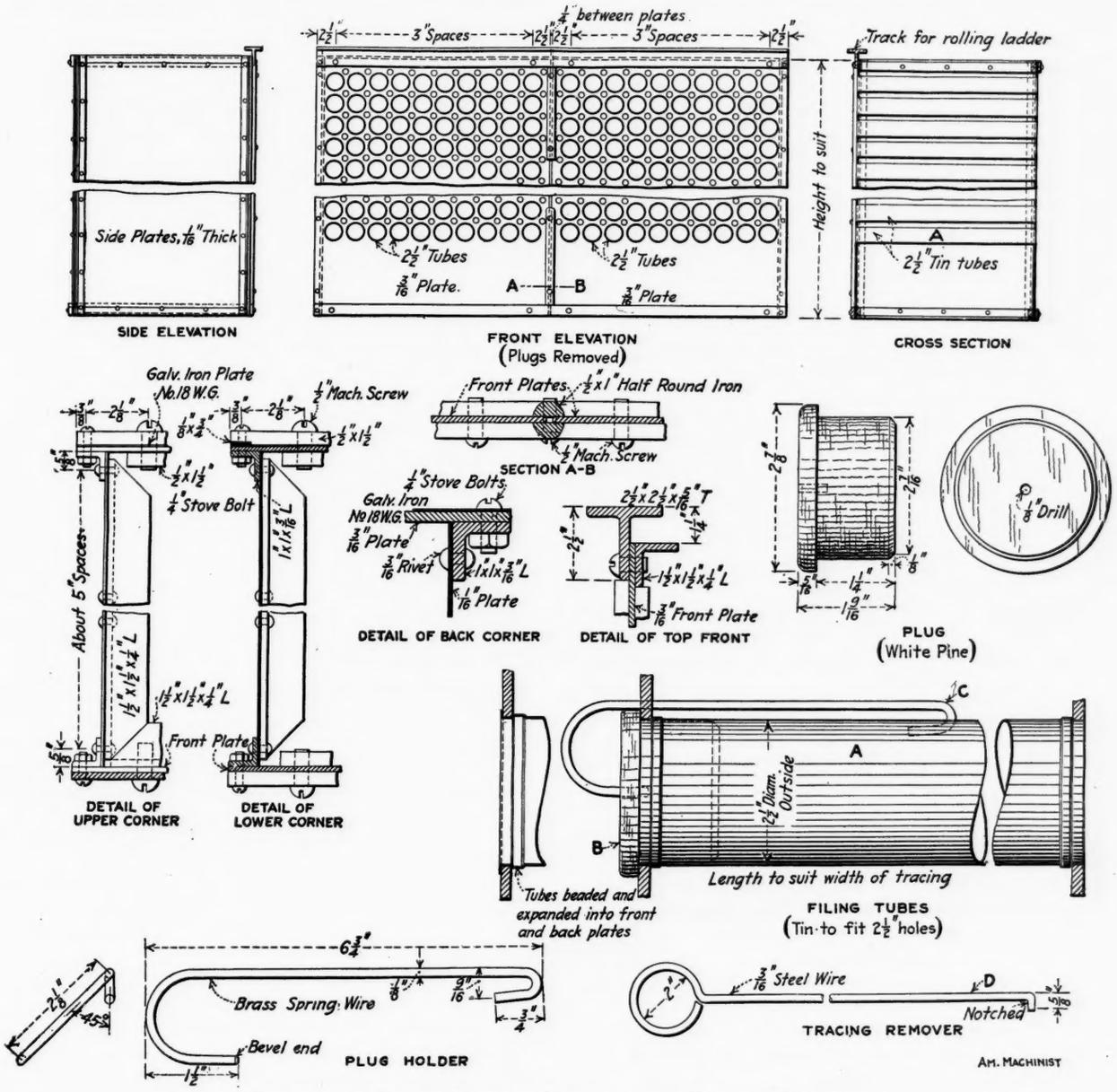
There are many methods of filing tracings, and most of them have their good features. However, no one method will answer the needs of every concern. There are many that carry on classes of work that demand tracings unusually long in relation to their width. In such cases it often proves economical and somewhat more convenient, to file these in rolls.

The accompanying illustration shows a type of filing cabinet for rolled tracings that has been in use for a number of years, and has proved satisfactory. The cabinet consists essentially of a number of 2½-in. diameter tin tubes *A*, suitably supported, and of a length somewhat greater than the width of the tracings to be filed. The tracings filed in this cabinet are protected from dust, etc., by wooden plugs *B* that fit into the front ends of the tubes. These plugs are provided with wire plug holders *C* that serve as loops for withdrawing them, and also permit

them to hang out of the way while the tubes are open. The plug holders slide in the small ½-in. holes shown in the front view of the cabinet.

Several tracings in one roll are filed in each tube; they are withdrawn by means of the tracing remover *D*, a steel rod which is pushed through the hole in the center of the roll until the hooked end protrudes through the which may be purchased from any stationer; these numbers may be made more durable by being varnished over.

As many sections of cabinet may be built up as the number of tracings to be filed warrants. Where a large number of sections are in use, it is better to have the numbers on the plugs fill up one section at a time, rather than to run horizontally across all the sections. One



DETAILS OF FILING CABINET DESIGNED FOR ROLLED TRACINGS

end. When withdrawn, this hook engages the end of the roll of tracings, and slips it out easily. These rods are kept hanging on hooks located at the division joints of the filing sections.

The wooden plugs closing the tubes are enameled on the exposed faces. If drawings of different classes are to be filed, plugs of different colors are convenient. The drawing numbers of the tracings filed in each tube may be stamped on the plugs with steel numbering stamps. Another way, which is somewhat neater, is to paste on the numbers, using the small block letters of black paper may then locate the desired tube, approximately, with the fewest steps.

A track is provided for a rolling ladder, which makes the high tubes of the cabinet easily accessible.—*American Machinist.*

For saturated steam, the velocity in pipes up to and including 3 in. diameter should be about 75 ft. per second, and for pipes above 3 in. diameter may be made 90 ft. per sec. The drop in pressure in a well designed piping system between boilers and engines should not exceed 1½ per cent. of the initial pressure.

The Perplexing Problem of the Bureau of Mines in Alaska

The initial prospecting for coal in the Matanuska field, Alaska, inaugurated by the U. S. Bureau of Mines for the Navy Department has been completed, and Dr. J. A. Holmes, director of the bureau, under whose supervision the work was carried on, returned to San Francisco en route to Washington on Oct. 20. Doctor Holmes made the following statement to *The Engineering and Mining Journal* representative at San Francisco:

"Our special work in Alaska was to find an area of coal of a character suitable for naval use and under favorable conditions for mining operations. We had 20 miners to aid the mining engineers and finally selected a location on the Matanuska River and we produced about 800 tons of coal, which is to be brought down the Matanuska River on the ice to tidewater during the coming winter. There it will be turned over to the Navy Department for actual ship test by one of the cruisers. The situation of the Matanuska field is about 45 miles northeast of the head of Cook Inlet. George Watkin Evans, mining engineer, of Seattle, was in immediate charge.

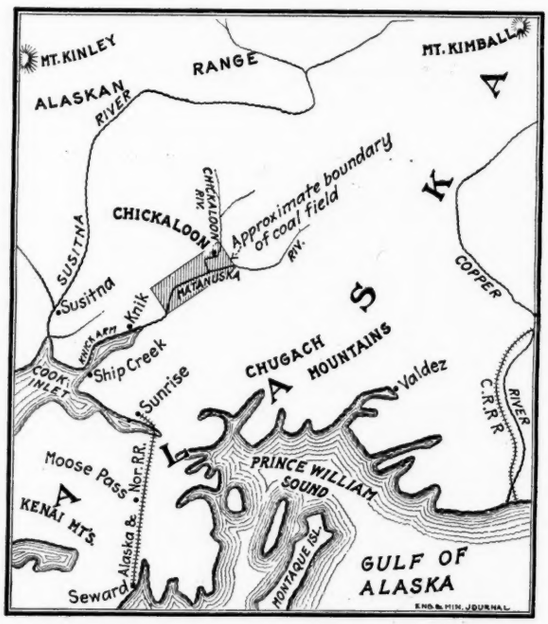
45 Miles in One Month

"The work remaining to be done is to get the coal to tidewater; but this cannot be accomplished until the river freezes solid. The brining of the 800 tons of coal a distance of 45 miles over the ice is a more serious problem than prospecting for coal during the summer. The coal will be carried on No. 5 Common-sense bobsleds hauled by two or four horses to each sled as may be required. Double-ender sleds, each pulled by one horse, will be employed as supplementary to the larger sleds. The condition of the ice on Matanuska River is what makes the problem of haulage a serious one. The climatic changes are irregular. The ice breaks and the water overflows, freezes into ice and breaks again forming a rough surface, and the wear of the projecting ice quickly mixes with the snow and becomes slush. There is added to this difficulty the fact that the banks of the river are sandy and gravelly in so many places and the wind frequently drives the sand and gravel over the ice, forming a sanded floor instead of a smooth ice surface. These are the problems to be met and the hauling of this coal down the river will be an experiment, as it will be the first attempt made at hauling large quantities and heavy loads. The coal-carrying capacity of the single-horse double-ender sleds is about two tons. The capacity of the No. 5 bobsled is four or five tons. Bins or sled boxes will be built on the sleds and the coal loaded in as compact form as possible.

"There has been one experiment made, in hauling a small sawmill up the river by one of the mining companies using horses and sleds, but I understand it required more than one month of time to make the trip of 45 miles. During the past winter mining companies on Copper River, where the conditions are somewhat similar, were able to make an average of five miles a day with horses and sleds. They hauled over two or three tons on single-horse sleds. They solved the problem of smoothing the roadway by using a snow-plow which was pulled by eight horses and which went ahead of the double-ender sleds. The purpose was to push all the rough ice and snow out of the way and leave a smooth track. They hauled their machinery, including steel pipe for hydraulic work, a distance of 260 miles into the interior of Alaska, using this method of haulage.

"The Matanuska River region never gets as cold as in the interior and the new ice that forms on top of the overflows on the river is not always very strong. The region is so isolated during the winter that we cannot take in either horses or supplies after early November and we cannot get them out before about the first of May. It is estimated that during that time the winter conditions will probably be favorable to hauling the coal for not more than two months of actual time; but whether it will be the first two or the last two months or scattered through the season one week at a time, nobody knows. So it requires preparation in excess of what would ordinarily be needed if good conditions were assured.

"The Matanuska region gives greater promise of agricultural development than any other part of Alaska that I have visited. It will be an easy region for the building of railroads and public highways, so that an agricultural population can easily develop there which would supplement the mining operations."



Matanuska, Alaska, Coal Field

Doctor Holmes before going on to Washington arranged for the chartering of a steamer to carry horses and supplies to Alaska for the work of transporting the coal from Matanuska field to tidewater. The sleds to be used will probably be obtained in Alaska. The steamer will go in through Cook Inlet and dock at Ship Creek.

The horses and supplies will then be lightered over the tidewater flats of Knik arm to the mouth of Matanuska River at the head of Knik arm, a distance of about 15 miles. The coal camp is at Chickaloon, which is on the north bank of Chickaloon Creek, near its confluence with Matanuska River. The accompanying sketch map gives the approximate boundary of the coal fields and the geographical situation of the camp. The coal fields lie between Susitna River and Copper River. The situation is about 120 miles southeast of Mt. McKinley and about 100 miles north of Prince William Sound.

Surveying Methods of the Consolidation Coal Co.

By A. W. Hesse*

SYNOPSIS—The Consolidation Co., probably has the most elaborate and complete system of surveying and mapping of any bituminous company in the country. Office computations are checked and rechecked. Coal exhaustion maps are prepared and special tracings made for photo-reproduction.

It has been said, "Mine surveying is little more than ordinary surveying rendered more difficult by darkness and mud. The main object being to take measurements which

3rd Quarterly Posting – Sept 20, 1913

3rd. North -6 Butt — J Smith, R. Jones, R. Johnson

	Set up [327 B.S. [326				
327 - 326	282°30	Vol 420 P.32			
327 - Spad	102°30	O.K			
327 - 613	102°30	S 77° 30 E	S 77 E	171.32	
			0°30		
	+25 & 35 =	Rm #7 Rt. +	35 R6 L4 +	31.20 =	
	7/1 +80 & 91 =	x c L +	80 R5 L7 +	84 & 96	
	Rm #8 Rt. +	92.10 = 8/1 +	142 & 153 =	Rm. #9	
	in 10' + 153 Rt.	7 R2 L7 +	149.30 = 9/1		
	+165 & 174 x c l	+ 174 R5 L5 +	192 - R6 L4 face	Wkg.	
613 - 614	12°45	N 12°45 E	N 13°E	25.01	
			0°00		
614 - Pts.	102°30	102°30	S 77°30 E	S 77 E	
	+5 Cor	R 5 L 4 +	20 = face	R5 L5	Wkg.
614 - 328	282° 31	N 77°29 W	N 78°W	182.24	
			0°50		
328 - 317	282°29	N 77°31 W	Tie + 0°01'	Vol. 420	P.18
7/1 - Pts.	192°30	S 12°30 W	S 13°W		
	+15 R10 L5	+25 R13 L5	face Wkg.		
8/1 - Pts	192°30	S 12°30 W	S 13°		

*[is symbol for station — Coal Age

Keeping Mine-Survey Notes

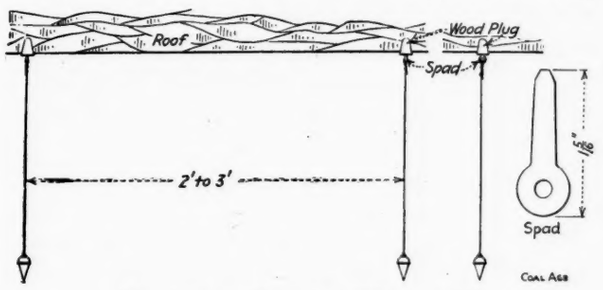
will furnish accurate maps of the underground workings, so that the position of every point may be known relatively to points on the surface." "Ordinary surveying" to most people means the use of a compass from which the needle courses of the property lines are read and the distances measured along the surface between the corners. The engineer of this day and date knows that this method gives inadequate results, and to follow this process in mine surveying would perhaps cause serious trouble, even in the loss of life and property.

To give some idea of the extensiveness of the mine-survey work performed for the Consolidation Coal Co. in the West Virginia field, it is only necessary to state that there are forty-three operating mines in an almost solid block of coal extending over a distance of nearly 43 miles along the Monongahela and West Fork Rivers, and several thousand acres lying along the Parkersburg, West Virginia & Pittsburgh and West Virginia Short Line branches of the B. & O. Railroad system. There is also one large mine operating in a field of about 2800 acres, lying in Barbour County, West Virginia.

In order to have all the survey work, inside and outside, properly correlated, a triangulation survey of the entire field was made and the triangulation stations referred to a system of coördinates. This system is the foundation from which all other surveys are started and on which they are finally checked for proof or verification. A description of the triangulation survey will not be attempted in this paper.

Surveying Methods

The surveys are all on true meridian, based on the triangulation survey, and the continuous vernier system of transit readings is followed. The bearings of all sights



Method of Setting "Pointers"

are taken by azimuths reading from zero, at the true north, to the right, an azimuth of 90° being due east, 180° being due south and 270° due west. In addition to reading the azimuth on all sights, the quadrant is read and recorded and the needle also noted as a check against reading and recording the alternate course reversed. Thus the needle is no longer the prime source of information, but is simply used to avoid errors in reading the vernier on the transit.

Vertical angles are read, when the measurements cannot be made horizontally, and later reduced to horizontals in the office. The 300-ft. steel tape, graduated every 5 ft., is used on all surveys and a 5-ft. steel tape is used to measure the additional distance beyond the graduation on the large tape.

Each mine has its individual set of station numbers, beginning with one and running up consecutively, except in room work where the stations are more or less temporary, and where a continuous system would cause a too rapid increase of station numbers. In front of each room is set a station, and designated in the notebook by a fraction, the numerator of which indicates the room number on that heading and the denominator the station number. Thus 6/1 indicates the first station placed for room num-

*Assistant chief engineer, the Consolidation Coal Co., Fairmont, W. Va.

ber six, $\frac{7}{3}$ indicates the third station in room number seven of that particular heading.

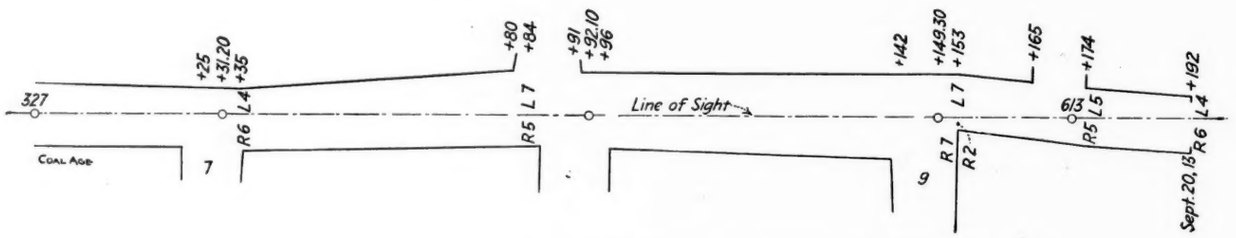
Station numbers need not follow consecutively on any particular heading, neither are they spaced at particular distances, except when turning off entries. The plus system of numbering stations is never used. Thus there may be three or four consecutive numbers on one heading and the next higher station number will be in an entry in an entirely different section of the mine. However, as each mine has all its survey notes recorded in a book for that particular mine alone, it is no trouble to locate the last station number used.

Room Sights and Side Notes

Since the lines of all mine work are laid off by the engineering department, it is necessary to indicate these lines in the mine, so that the mine foreman can direct his closer to the point under which the set up is being made.

The stations are marked with a painted white circle around the spad and the number on the nearest rib. Pointers are designated by crosses, the center of the cross being the spad. Stations are usually advanced every three months when the quarterly measurements are taken. At this time surveys are also tied in if possible, in order to keep all work going along accurate lines. The mine survey consists of a series of loops starting at the mouth of the opening.

In locating the various features of the mine work, side notes are taken from the established line of sight. The accompanying page of survey notes demonstrates this more clearly. It will be noted from these records that sights, or courses, are always checked between stations in order to make sure that the stations still occupy the same positions they did when they were set and the readings



Consolidation Coal Co. Plotted Side Notes of Survey on Previous Page

Levels in No. 1. North Heading June 20, 1909				(Left hand page)	Smith / Jones	(Right hand page)					
B.M.	3.070	910.371		913.441		. Spad in Roof at 3rd Rt. = *[237 Vol. 420 P. 30					
			4.20	906.17		Bottom at	+1300				
			3.90	906.47		" "	+1400				
T.P.	3.123	909.704	2.456	912.827		Spad in Roof = [503					
			3.10	906.60		Bottom at	+1500				
T.P.	2.501	910.115	2.912	912.616		Spad in Roof = [504					
T.P.	4.113	910.615	3.613	906.502		Top of Rail at Switch					
			2.781	913.396		[237 Above					
				913.441							
				0.045 = Tie		*[is symbol for station					

Coal Age

System of Recording Level Notes

work. Therefore, "pointers" are set as often as required to facilitate good alignment. These "pointers" consist of two steel spads, shown in the accompanying figure, placed in the roof in wooden plugs driven into holes drilled for that purpose. They are spaced not over 3 ft. apart in order that the strings hung from the spads may be easily seen when one light is used in lining over them. All "pointers" indicate the center line of the heading.

The mine survey differs from outside work in that stations are never placed in the bottom, but in the roof. In setting up a transit the plumb bob is hung from the station in the roof and the telescope, which is center punched, is brought to the point of the plumb bob and leveled. This gives the transitman a better opportunity to get his telescope directly under the station, since it does not necessitate taking his lamp out of his cap, giving him the free use of both hands and places his eyes

taken; also to catch up the possibility of an error being made when the stations were set. The accompanying figure shows the entry plotted from these notes. At the face the date of the survey is marked to show the position the heading occupied at that time.

All elevations on the inside are run by precise levels starting from benchmarks on the outside established from U. S. G. S. benchmarks. The readings are taken on the bottom of the seam every one hundred feet and in some localities closer, depending upon the irregularity of the coal. Every six months the levels are advanced to the breasts of the working places, no elevations being taken in rooms except for special purposes. Benchmarks are also established ahead, usually being placed on a station or pointer in the roof and B. M. marked on the rib opposite. The method of recording inside level notes is shown in the accompanying drawing.

Form 182 500 F24805

THE CONSOLIDATION COAL COMPANY. ENGINEERING DEPARTMENT—TRAVERSE SHEET NO. .. FOR .. MINE

Vol.	Page	Sta.	Hor. Angle: Azimuth	Hor. Angle: Quadrant	Slope Distance	Meas. Angle	Hor. Distance	Vert. Angle	Cor. Rod	Lat. Difference: Plus	Lat. Difference: Minus	Elevation	Lat. Difference: N	Lat. Difference: S	Dep. Difference: E	Dep. Difference: W	Total Latitude	Total Dep.	Station	Remarks
420	36	327	102°30	S77°30E	171.32	0°30′	171.31	These spaces used for working up elevations on outside surveys from vertical angles	6 Butt				24.39	37.07	167.23		North 2001.33	West 50.10	327	See Sheet No. 5
		613	12°45	N12°45E	25.01	0°50	25.01						39.49		5.52		1964.26	E 117.13	613	
		614	282°31	N77°29W	182.22		182.22									177.89	1988.65	122.65	614	
																	2028.14	W 55.24	328	See Sheet No. 5
																	2028.06	55.18*		
																Tie =	+0.08	+0.06		*Worked up values from other stations.
		Calculations by			and			Copied by				Checked by					Approved:			Division Engineer

Calculation of Surveys

The first step in the office work is to reduce all slope measurements to horizontals. These calculations are performed in duplicate, one set by a table of Gurden and Naturals and the other by logarithms, and the results check one against the other. The transitman in the meantime transfers his data as far as possible to traverse sheets, copy of which is shown herewith. Usually each mine entry has an individual traverse sheet for the stations it contains. After the horizontals are copied into the notebook and checked, the courses and corresponding distances are then copied into a separate set of calculation books and the latitude and departure differences worked out by the same method employed for horizontals, and also checked. The results are copied on the traverse sheets and the total latitude and departures worked out and checked before plotting.

No survey is permitted to stand until approved by the division engineer in charge. His approval is shown on the space provided for his signature at the bottom of the traverse sheet. All sheets are carefully referenced from one to another when the surveys have any connections whatever. A separate folio or binder is used to hold the sheets for each mine and they are numbered consecutively from "one up"; the sheets are of course all indexed.

Maps

The State of West Virginia requires by law that: "The operator or agent of every coal mine shall . . . . . make or cause to be made . . . . . an accurate map or plan of such mine, on a scale to be stated thereon, of 100 to 200 ft. to the inch, ... and a true copy of such map or plan shall . . . . . be delivered every six months by such operator to the inspector of his district." In conformity with this law, the standard scale, adopted by the Consolidation Coal Co., is 100 ft. to the inch, but owing to the extent of the territory, region maps on a scale of 500 ft. and 1000 ft. to the inch are reproduced by pantograph reductions.

The maps are made on a high-grade mounted paper of 60-in. width and length to correspond to the field or allotted territory. On the 100-ft. to the inch maps, before any stations or features are plotted, the maps are blocked out by coördinate lines at intervals of 1000 ft., running due north and south, and due east and west. The stations are then plotted on the map by the coördinate values they bear and checked by the courses and distances between them. All outside stations and elevations are shown in red and all inside stations in black. From these stations, and lines of sight, all the other features are placed on the map. All surface features of any importance or in any way affecting the mining operations are shown, including property corners, land lines, county and district lines, outcrops and so on.

All mine work is portrayed by black lines without shading of any kind, and the robbing by the hatching of pillars extracted. The progress of the mine work is indicated by printing the dates at the end of each posting. Inside elevations are shown in blue and are placed in the pillar opposite the point at which they are taken. This is done to avoid confusing with the station numbers which are placed in the heading with the circle, indicating the location of the station.

From the maps, tracings are made, showing all the above features and blueprints are taken for the use of the superintendent and mine foreman of each mine, besides for the various other officials using them. Before these prints are sent out, the projected work, for the next three months at least, is shown in colored crayon or erasing fluid, and all necessary distances which rooms or entries are to be driven are indicated thereon.

At the end of each year tracings are brought up to date from the maps, the lines on which are made heavy enough so photographs can be taken. These photographs reduce the work to a scale of 500 ft. to the inch. From the plates, white prints are made for distribution to the various officials. On this scale, the prints are of convenient size for carrying in the coat pocket during inspections. They are also bound in a folio form for such officials who are constantly referring to the mine work, the use of the larger prints being too cumbersome.

Progress tracings are also brought up to date at the end of each year's work, to show the yearly progress of the mine work and for calculating the worked-out acreages. These acreages are computed with a planimeter. Each year's work is shown in a different color.

Besides obtaining the areas of worked-out territories, a sufficient number of heights of seam are taken during the year to determine the theoretical tonnage for each year's work, and compared with the actually reported tonnage, to obtain the percentage of recovery.

The Oneida No. 2 Anthracite Drainage Tunnel

By M. C. Reed*

SYNOPSIS—A drainage tunnel in solid rock was driven to save pumping in one of the mines of Coxe Bros. & Co. This heading was 7030 ft. long and was finished in about one year and 16 working days, averaging the time expended at each end and deducting delays for which the contractor was not to blame. The tunnel progressed at each end about 9.2 ft. every 24 hr. As much as 387 ft. was driven in a single month at one end of the tunnel only. The average speed in solid rock, at each end of the tunnel, was 10.3 ft. per 24 hr.

The development of the anthracite mines in eastern Pennsylvania has been retarded, particularly during the last few years, by the presence of large quantities of water, which had to be removed at great cost, by elaborate systems of pumps. In order to reduce this cost, and to permit the opening up of lower levels of the mines a number of drainage tunnels have been driven.

Among these may be mentioned the Lausanne or Mauch Creek tunnel, near Mauch Chunk, Penn., which constitutes the outlet to the Lehigh River, for what is known as the Buck Mountain gangway. This latter is a series of passages about 13 miles in length, driven three or four years ago to drain 14 different collieries in the Panther Creek basin, between Mauch Chunk and Tamaqua. The Lausanne tunnel is 7500 ft. long.

The Oneida tunnel in Schuylkill County, which is 5600 ft. in length and was driven about the same time, drains the mine of Coxe Bros. & Co., operated by the Lehigh Valley Coal Co. Water from the tunnel passes through the Tomhickon Valley by way of the Catawissa and Susquehanna Rivers. The driving of this tunnel made the use of five large mine pumps unnecessary.

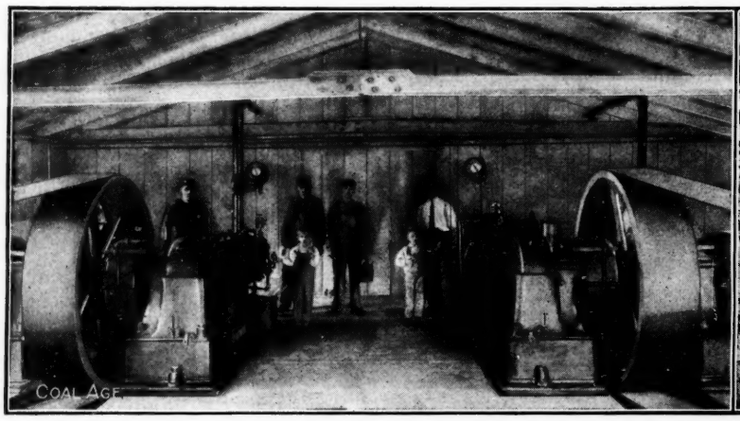
Both the Lausanne and Oneida tunnels were driven by the Portland Contracting Co., of Pottsville, Sullivan "UH" 3⅝-in. differential-valve drills being employed in both cases.

*Scranton, Penn.
From "Mine and Quarry," January, 1914.

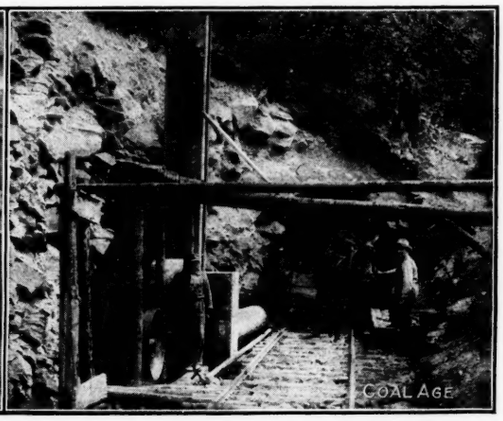
Oneida No. 2 Tunnel

In June, of last year, the same contractors completed a second tunnel at Oneida for the Lehigh Valley Coal Co., parallel to the first, and about one mile distant. While the first tunnel drains what is known as the No. 1 basin, the second, 7030 ft. long, drains the No. 3, No. 4, No. 5 and No. 6 basins, an area approximately four miles long by three-quarters of a mile wide. Comprised in this area are Nos. 2, 4, 5 and 6 slope mines, and No. 3 shaft mine.

The tunnel pierces the mountain running between Oneida and Nuremberg, and discharges water from the mines into the Tomhickon Creek, doing away with the pumpage from 20 large mine pumps, the lowest of which has been obliged to lift water a height of 500 ft. Its construction has made possible the operation of the coal to the bottom of the basin.



Temporary Power House and Compressors at Oneida No. 2 Tunnel



Equipment for Ventilating South End of Tunnel

This second tunnel is driven at a grade about 110 ft. lower than the first. It slopes 23 ft. in the entire length of 7000, giving a good fall and rapid runoff for the water. The inside, or mine end, is at the foot of the No. 5 slope in the Buck Mountain bed; the outside, or surface end being in the Tomhickon Valley.

Work was begun on the inside end on Apr. 16, 1912, and at the surface near the little town of Nuremberg, May 19. The tunnel is 7x9 ft. in cross-section, and is driven its entire length through solid rock. This ranges from hard, close-grained, dark conglomerate, pitching at an angle of 45 deg., at the inside end, successively to coarse-grained conglomerate blue rock of a close grain, and finally red shale, at the surface end of the tunnel. The pitch of the rock flattens out, from the inside end, until it is practically horizontal when the surface is reached.

The coal company awarded the contract to the Portland Contracting Co., on the bonus-penalty basis, in order to secure as rapid progress as possible. A certain bonus was offered per day, for each day the tunnel was finished ahead of one year's time, and a like penalty

per day was provided for each day over one year, required to complete the work.

Equipment and Organization

While the work on the approaches of the tunnel was proceeding, the contractors established a power house and compressor plant, near the top of the No. 5 slope, at Oneida, consisting of two Sullivan, class "WJ" cross-compound, belt-driven air compressors, with air cylinders 18 and 11 in. in diameter, by 14-in. stroke, with a rating of 680 cu.ft. of free air per min., at 165 r.p.m. These compressors were operated by belt from motors, taking current furnished by the Harwood Power Co.

The motors were of the 440-volt alternating-current type, of 150 hp. each. The compressors are of the two-stage pattern, with intercoolers, of large cooling area, and having their main bearings, cranks, eccentrics, guides and cross-heads inclosed in a dirt-proof casing, partially filled with oil, to provide automatic lubrication. On account of the hardness of the rock at the inside end, an air pressure of 120 lb. per square inch was maintained at the receiver, from the time the compressors were started until the work of tunnel driving was completed.

A 5-ft. exhaust fan was installed at each end of the tunnel, to provide the best possible ventilation. An 18-in. asphalted pressure ventilating pipe was carried as close as possible to the heading, so as to clear out the foul air resulting from the blasting as soon as possible.

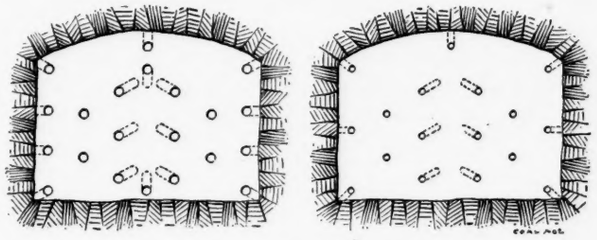


Diagram of Shotholes

Fig. 1. Hard Rock Round Fig. 2. Soft Rock Round

A boarding house, providing good beds and good food, was established at each end of the tunnel.

The tunnel was driven three shifts per day, including Sundays and holidays. The labor force was made up as follows:

One superintendent, 2 foremen, 6 chargemen, 18 drill runners, 18 helpers, 6 muckbosses, 24 muckers, 4 drivers, 3 dumpmen, 1 stableman, 2 compressor runners, 2 to 4 blacksmiths, 2 to 4 blacksmith helpers, 1 timekeeper and 1 clerk.

Tunneling Methods

The bonus-penalty work was started with the actual driving of the tunnel, on July 7, and included 6800 ft. of the whole distance. By the completion of the tunnel on June 7, 1913, the contractor finished 34½ days ahead of time, allowing for 454 hours of delay, for which the coal company was responsible as it was caused by high water, during January, March and April.

At the outside end, Sullivan "FF-12" Liteweight 2⅝-in. differential-valve rock drills were employed, mounted on double-screw columns. These were replaced later, when the rock became harder, by Sullivan "UH-2" 3⅝-in. machines. Two drills were ordinarily used in each heading, but when unusually hard rock was encountered, three drills were regularly employed. When the third drill was required, this work was done by the "FF-12" machine, to drill what would ordinarily have been dry holes. Drills of another make (also 3⅝-in.) were used on the inside end.

The sketches show the round which was employed. Fig. 1, with 21 holes, shows the hard-rock round, and Fig. 2, with 17 holes, shows the round in softer rock. The cut holes were drilled 8 ft. deep, and the relievers and side holes 7 ft. deep; a round thus ranging from 125 to about 160 ft. of holes.

The drilling crew consisted of three drill runners, three helpers, a muck boss and four muckers, making eleven men, to which should be added one chargeman, one driver and one dumpman. The holes were fired by an electric battery, the cut holes being fired first, then the relievers, and then the rib holes. One hundred pounds of 60 per cent. dynamite were required to pull the round, giving an average advance per shift, for the entire work, of 3.4 ft. per shift, or 10.3 ft. per day of 24 hr. for each heading. This average includes all losses of time. The actual rock pulled ran to 5½ ft. per working shift.

Slick sheets were placed in front of the face before each round was fired, to facilitate shoveling. The muck was removed by cars hauled by mules, each car being 8 ft. in length by 4 ft. wide and 4 ft. high. Owing to the solidity of the rock, and the fact that the tunnel was to be used for drainage only, no timbering was required, and no lining was placed.

The best month's progress for a single heading was 387 ft. and was driven by Sullivan 3⅝-in. drills in the south end in a bluestone rock during May, 1913, and the best progress for both headings was also in May, amounting to 754 lin.ft. of tunnel. The following table shows the progress by months, from April, 1912, to June, 1913, inclusive:

	North End, Feet	South End, Feet	Total, Feet
April, 1912	...	80	80
May, 1912	115	94	209
June, 1912	186	23	209
July, 1912	228	...	228
August, 1912	219	186	405
September, 1912	252	192	444
October, 1912	294	315	609
November, 1912	321	372	693
December, 1912	309	309	618
January, 1913	327	342	669
February, 1913	309	351	660
March, 1913	351	300	651
April, 1913	327	240	567
May, 1913	367	387	754
June, 1913	...	...	234
			7030

In addition to the contract price, the Portland Contracting Co. received a bonus, for the 34½ days which they gained over the contract time, in completing the work.

Acknowledgement is made to the officials of the Portland Contracting Co. for assistance in preparing this article.

A machine so arranged as to mine the coal without any time being spent in unloading the machine from its truck has a great advantage over any other type of coal cutter. Many operators throughout the country have taken advantage of this fact, and are installing mining machines self-contained upon a truck. The machine above described on account of its high speed both in cutting, adjustment and self-propulsion, lends itself readily to the most economical and safe methods of mining coal.

Status of the Coal Industry

By Thomas L. Lewis

SYNOPSIS—The industry of coal mining is the least respected in the nation and nothing but organization will secure it that respect to which it is entitled. All organization should be specifically for the betterment of labor and should seek to regulate prices only that such an end may be obtained. The industry has no representation in Congress and because it is unorganized, its voting strength is wholly negligible.

There are in the United States probably about ten thousand coal corporations. My friend beside me says thirteen thousand and I am glad to be corrected, because the more there are, the greater emphasis can be put with reason upon the considerations I have to bring to your attention.

The Least Respected Industry

Despite the number and importance of these corporations, the coal industry is the one that is least respected by the American people! There is something wrong in this situation. The coal trade furnishes over sixty per cent. of the railroad traffic of the United States; it moves every other ton of freight in this country; it makes it possible for every person in the United States to travel from one section to the other; it gives value to every farm from the Atlantic to the Pacific Ocean. Without coal, we would have no Pittsburgh, the greatest industrial center in the world.

We recognize, at least I have recognized for years, that an industry which is so important as this, not only to the industrial development of our country, but also to its commercial and its agricultural development, and in fact to the progress that the country has made along every other line, is entitled to more consideration than it has received from the public men of the United States.

There are probably 5 times as many directors as there are coal companies or 65,000 men, 13,000 bookkeepers, 13,000 weighmen, 16,000 mine foremen, 10,000 to 12,000 mine superintendents, as many traveling salesmen, in fact not less than 125,000 men, representing the operating forces of the coal industry. In addition there are about 750,000 workers in and around mines, making in all 875,000 people. Yet what consideration do they receive from the law makers of this country?

We are required to find the money for safety appliances and to meet the expenditures necessary under the liability laws or their successors, the compensation laws, but as there is no uniformity between one state and the next, there is no way of finding the money with which to finance such expenditures.

An Industry Large Enough to Arouse Cupidity Yet Unable to Resist Attack

But concurrently with new burdens have come a tendency to levy special taxes. Ours is a large industry employing nearly a million men, representing hundreds of millions of money and the temptation to tax it, is too great to be resisted. Thus coal in Pennsylvania is taxed *in* the ground and again as it is brought *out* of the ground. It will not be long before it is taxed in transit and the coal operator will pay the bill. And it will have to be paid because the coal operators have never combined to protest against the injustice.

It seems to me that if the mine owners of this country realize their strength they will say to the American people, "We are willing to assist every movement for the public good. We are ready to furnish the best safety appliances which can be secured to protect the lives and health of our employees. We are prepared to give to those employees the highest standard of wages consistent with American livelihood, civilization and comfort. We are willing to pay our share of the taxes needed to run the government. But we are not going to go any further until other industries contribute the same proportion as we do to the support of the national institutions."

Industry Representing One Per Cent. of the People Is without Representation

We find on looking over the official roster at Washington that there is not a mine owner in Congress. Once in a while, we find a man in the Senate with an interest in mines, but he keeps the fact in the background for fear he might lose votes at home. This may be good political caution, but it is most injurious to his business and ours.

Now what is the remedy? How can we compel the American people to respect our rights and our interests? I take the position that the coal industry should organize and that there should be a minimum price for run-of-mine coal, or fuel coal at the mine, which minimum should be $1.25 a ton and as much more as we can get for the benefit of this industry.

Some people say, of course, that the moment you begin to talk about organizing for the purpose of fixing prices you are in the shadow of the penal institutions of this country. I do not believe that. Operating men tell me very frankly, "You go up against it once and try it." I know that the attorney general of the state of Ohio makes a declaration that he will prosecute men who meet for the purpose of discussing prices, and that he states that under the Valentine law of our state he can send such people to jail. And immediately there is a scattering to the woods, and any talk or attempt to talk about organizing is immediately "catching" and must be avoided. Why?

Meet in Washington, D. C., and Invite the Cabinet

The trouble has been that the mine owners discussed prices first. Like the mine workers, I would leave that out of consideration. I would first organize all over the United States and then I would try to impress upon the minds of the mine owners all over this country the necessity of having a national convention of operating men at Washington. Invite the President of the United States into that convention. Bring the members of the Cabinet there. Bring the members of the different committees of Congress. Tell them not only what you want, but tell them you are going to have it, or there will be somebody going out of office. Can you do it? How do other people do those things? Why is it that the iron

Note—Impromptu address at the banquet of the Coal Mining Institute of America.

and steel men, the pottery men, the gas men, the transportation men, the agricultural interests, can go to Washington and immediately command attention whenever they want anything enacted into legislation? They can at least get a hearing; if they cannot get all they want they can always get a big per cent. of what they are after. All our difficulties arise from our failure to utilize our strength properly, in the manner I have just indicated.

Hundred Per Cent. Organization Not Needed

The mine workers of this country within the past 15 years have advanced their wages one hundred per cent. with less than fifty per cent., yes, with practically only forty per cent. of the men in the organization. And they have done this, not because they were volunteer members but because they have been able through their representatives to go into conventions with mine owners. And why have they been successful? Not because they were so perfect in their position, not because they had more intelligence than the mine owners, not because they were able to prove their case any better than the men who were mine owners, not at all.

They were able to be successful because of the division in the ranks of the operators and because of the prejudice and suspicion that existed in the minds of the mine owners against each other. The owners were always willing to pretend that they were going into a joint convention united; but it was a half-hearted unity, for the reason that every operator was wondering how it was going to affect his own individual interest. He was more interested in himself than he was in the general uplift of the industry. And what was the result? He forgot the fact that if he worked for the welfare of his fellow operators and his miners, he necessarily was working for his own good and his own betterment.

The operators of this country must organize in order that they may help lift the industry to a higher plane and give it greater stability in the eyes of the American people. In this age of collective effort, not any of us can stand out alone and go through life successfully.

Constitution for Operators

Let me give you an outline of what I would consider a good preamble for a constitution for the operators. After stating the importance of this industry to the general welfare of the nation, after rehearsing the necessity for doing something for the people of this country through the development of the coal industry, I would declare as the objects of a national association: First. We are organizing for the purpose of conserving the most important commodity in this country, which cannot be replaced, that is coal. We are organized for the purpose of recognizing the hazardous occupation of our employees, for the purpose of providing the very best possible facilities to safeguard their health and protect their lives. We are organizing for the purpose of favoring compensation laws, instead of liability laws. We want to take away from the legal fraternitly the desire to run after the fellow that is injured and get his case and go into court and spend more money in the court than will be paid over to the poor fellow that is crippled. We want to do away with liability laws, to substitute compensation, to take care of the injured and the crippled and the aged workmen in the mining industry. We declare in favor of a uniform system of compensation laws all over this country, and we are unwilling that the coal industry alone shall pay the cost of that compensation." I claim that if there are five times as many men killed in the mining industry as in farming; this industry, nevertheless, is so important to agricultural development and the success of the farmer that the farmers of the United States should contribute somewhat to the protection of the lives of the men in the mines.

I would declare further that we are in favor of giving to our employees the highest standard of wages paid any class of American workingmen. We declare in favor of permitting them to work the least possible number of hours consistent with the production of the necessary amount of coal. And then I would insist that we must secure for every ton of coal such a price as will enable us to provide these very things for which we are organized.

Where is there a man, where is there a woman in this country who could take issue with that position? They cannot say to a mine owner "You *must* sell your coal." I would like to see the time come in this country when they could say to the miner "You *must* dig coal, whether you want to or not!" If it is right for the miner to refuse to work at a certain price, isn't it just as equitable and can it not be made just as legal for a mine owner to refuse to sell a ton of coal at a price that means a loss to him? I think so. And I believe that when the American people and the men in the Congress of the United States and in the different state legislatures understand the position of the men in the mining industry, they will be ready to fall over each other to come to their assistance.

Why? Because men in public life are looking for votes. And I am sure that if the mine owners of this country organize, and if they appeal to the better side, to the intelligent side, of human nature, they will get public cooperation. Whenever you want anything done you must meet in Washington, you must go to Harrisburg, to Columbus, Indianapolis, or Springfield, and you must lay your case before the public men and tell them that your rights must be respected. It is not such a difficult matter if you get started. But this great bugaboo of some attorney general coming around with a legal club has too often frightened the mine operators of this country into a condition where they are afraid to discuss anything pertaining to the industry.

Get out of the minds of the laboring men of this country the idea that the employer has no interest at all in them, and you have accomplished half of the great work necessary to eliminate strikes from your industries in the United States. I do not take the pessimistic view many people do of the future. I may not live to see the future I predict, but it is well worth our while to work to bring about a condition such as I have described.

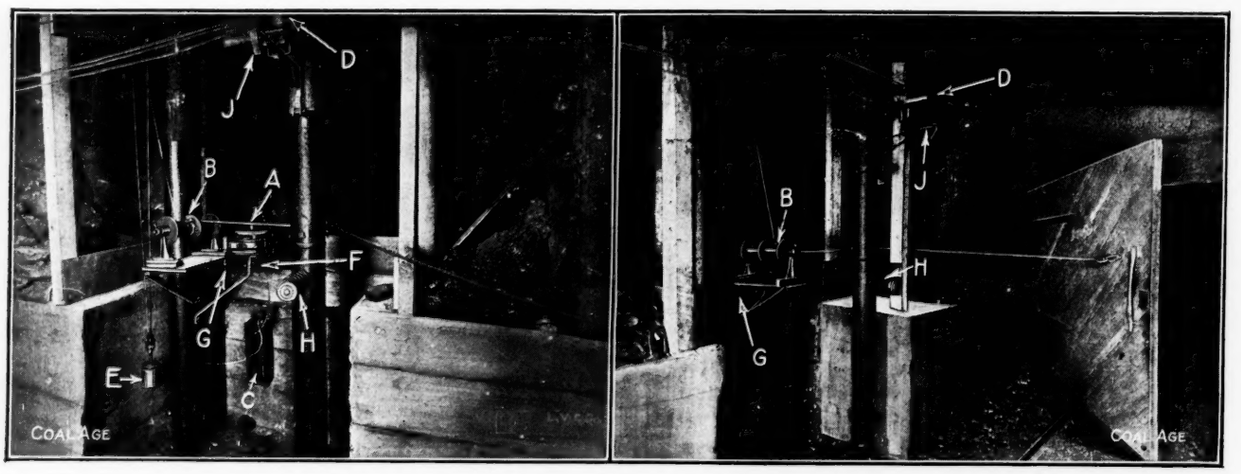
In the design of a boiler plant it is well to remember that (1) some part of the plant must be at work all the time throughout the year; (2) that flues must be cleaned and chimneys or stacks repaired without stopping or imperiling the supply of steam. Variations of load, peak loads and emergencies can best be dealt with by an easily regulated artificial draft, and the commercial value of any battery of boilers can thus be raised by working on the over-load capacity of the boilers, though doubtless at the sacrifice of some efficiency during such periods. Generally speaking, induced-draft fans are adapted to bituminous fuels which are burned on chain grates or other open-grate types of stokers and forced-draft fans to anthracite coal, which is consumed on closed grates.

Electrically Operated Mine Door at Seneca Colliery

SYNOPSIS—This article describes a trap door which is operated by the driver without stopping his trip. It saves hiring a boy and the costs are only 10c. per day.

The *Employees' Magazine,* published by the Lehigh Valley Coal Co., gives the following note on an electrically operated mine door, perhaps the first of its kind ever built. It was recently installed in the main motor road of the Phœnix and Columbia section, about 2000 ft. from the foot of the shaft at Seneca Colliery. It has given such perfect satisfaction that the attention of a trapper is no longer required. Consequently, the possibility of accidents due to carelessness, oversight or other human weaknesses, is entirely eliminated.

The whole operating mechanism rests on a piece of sheet iron fastened to two wrought-iron pipes 6 in. in diameter, standing upright about 4 or 5 ft. to one side of the track. These pipes also act as a roof support. The apparatus consists of two single-knife switches, a 2½-hp. General Electric cable-reel vertical motor *A,* connected by a set of bevel gears or two horizontal cast-iron cylindrical drums *B,* a rheostat *C,* an electro-magnet *D,* and a 15-lb. counter-balance weight *E.* The switches, motor, rheostat and magnet are all connected in series, and the whole connected onto the trolley circuit. The switches are located on the ribs about 300 ft. each side of the door.



A Device by Which a Mine Door Can Be Opened by the Driver without Leaving His Seat

Driver Can See If Door Is Open

Two lamps are hung from the roof of the gangway on each side of the door, so that when it is closed, only two lights can be seen; but when it is open, all four lights are plainly visible. Thus the motorman can easily tell from the distance whether the door is open or shut.

On approaching the door, if closed, the motorman throws in the switch, which is in easy reach, and the small motor at the door begins revolving. A 4½-in. spur gear *F* on the end of the armature shaft drives an 11-in. wheel *G,* which, in turn, through a set of 4-in. bevels causes the two cylindrical drums, about 3 in. diameter, to rotate. On one of these drums is wound the rope that is attached to the door, pulling it open, while the other drum takes up a rope attached to the weight. The weight acts as a retarder in opening the door and as an accelerator when the door is released to swing shut.

Automatic Safety Provision

Attached to a third wrought-iron pipe, close by the other two, is an electro-magnet about level with the top of the door. Should the current for any reason cease flowing while the train is going through the doorway, this magnet would release a hook *J,* which would catch the top of the door and hold it until the current came on again.

On this third post and about three feet up from the bottom of the door is a heavy spring buffer *H,* which acts as a cushion when the door strikes it in opening, and which assists in closing the door when the current is cut off. On reaching the second switch the motorman pulls it open; thus shutting off the current from the small motor and releasing the door. The operation is repeated in the same manner on the return trip. There is only one electric locomotive on this road, making on an average six trips a day in each direction.

The door is built of yellow pine, and is 7 ft. high by 8 ft. wide. The current flowing through the small motor is about 8 amp. at 250 volts, direct-current. It is of such design that it can be in service continuously without burning up.

The Cost Is 10c. per Day

Aside from the safety point of view, the operating economy is also a feature well worth considering. The depreciation and maintenance costs, etc., of this entire apparatus is about 1c. per day, and the cost of current consumed by the motor is not over 9c. per day, making the total for operating this door per day not over 10 cents.

Thomas O'Brien, general inside foreman of Seneca colliery, conceived this device, which was built under the direct supervision of Harry Gilford, inside electrician at Seneca.

A New System of Electric Blasting

The system of shot firing here illustrated and described has been put into successful operation, and the shaft of the Cottonwood Coal Co. at Windham, Mont. The details were worked out, and the apparatus installed by the company's electrician, Mr. Webber. The system is extremely positive in its operation and no one can tamper with the blasting switches.

As may be seen in the accompanying drawing, connection between the fuse wires and the firing cables may be made at any convenient point in the mine. When all is ready for detonation the shift boss repairs to the hoist house, where the firing apparatus is installed and he and the hoist engineer each unlock their respective boxes. These, as may be seen, are substantially built, provided with strong hinged covers and durable and reliable pad-

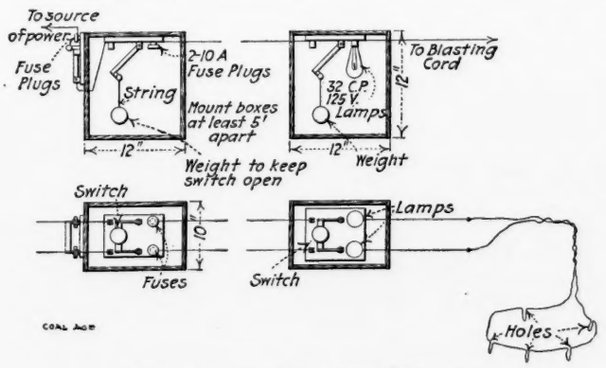


DIAGRAM OF BLASTING SYSTEM

locks. Each box contains one of the two connections necessary to be closed in order to send the current through the detonators.

The ordinary knife switch placed upon the outside of one of the boxes is first closed; next, one of the weighted switches is closed and held in position until the other weighted switch can be thrown, when the shots are fired. A 250-volt circuit is employed. The weight on the switches must be heavy enough to pull them open when they are realeased in the closed position. The two lamps used are 32 candlepower, 125 volts, as these are in series with the circuits.

It will be readily seen that with the boxes placed in the positions shown that it requires two keys to gain access to the two switches and the concerted action of two operators is necessary to close the circuit. This renders it impossible for shots to be fired under any circumstances, except deliberate intention on the part of at least two persons.

Anthracite Operators Purchase $28,000,000 Worth of Supplies Annually

That there is a market among the anthracite operators of Pennsylvania for over $28,000,000 worth of such materials as are used in the mines is the conclusion reached by a statistician who has been carefully compiling the material costs of a number of the larger companies. The exact figures at which he arrived as a result of elaborate computations was $28,233,352.60.

The largest item in this huge total is for machinery and castings which aggregate $3,568,299.68 a year; the next largest is for mine timbers and "lagging," which cost the companies $2,593,280 a year; and the third is for lumber, of which $2,540,989.30 worth is purchased annually. It should be remembered that these quotations are exclusive of the immense labor costs.

The following dozen items show some of the big annual expenses to which the operators are subjected, the powder and dynamite, however, being ultimately resold to the miners:

Dynamite	$1,744,067.00
Miscellaneous	1,457,367.00
Wheels, axles, etc., for mine cars	1,151,322.65
Feed for horses and mules	1,073,859.40
Powder	883,066.21
T-rails and fastenings	864,184.00
Electrical supplies	803,514.27
Pipes and fittings	645,905.03
Water	591,863.56
Mine ties and rails	563,245.40
Sheet and plate iron and steel	551,511.94

Included in the bewildering list of items which add to the annual expense are caps, fuse, wire, shovels, picks, bar iron and steel, nails, spikes, bolts, nuts, screws, files, tools, babbitt, lead, brick, lime, stone, rope, canvas, brattice cloth, belting and hose, valves and packing, wire rope, mine cars, roofing and pipe covering. It is, furthermore, true that the aggregate cost of mine supplies is increasing each year with the deeper shafts and longer hauls below ground of the ever-widening mines.

British Columbia Coal Commission's Report

SPECIAL CORRESPONDENCE

About a year ago the government of British Columbia appointed a provincial commissioner to investigate many matters in connection with the production and sale of coal in the province. His report was lately submitted to the government and is now under consideration.

Among the recommendations made by the commissioner are the following:

Establishment of sizes and quality of the various classes and grades of coal known to commerce as applicable to all of the coal fields of the province.

Inspection, government or otherwise, of classes and grades of coal sold to the public. (It is suggested that this object may be attained by the natural working out of opposing interests of buyers and sellers in the trade, if sizes and quality be standardized as recommended.)

Delivery in bulk instead of in sacks as at present, the former allowing less chance for the delivery man to cheat the buyer. Price to buyer to be reduced correspondingly to elimination of cost of sacks and sacking.

Short-ton basis to be substituted for the long-ton system at present in force on the British Columbia coast. Mine weighing and weights to be under supervision.

Reduction in railway freight rates on coal, so as to admit of coal from interior district mines competing in coast market with that from coast mines.

Complaints of consumers made to the commissioner included high prices, inferior quality of coal, shortage in weight and shortage of supply.

AVERAGE COST OF PRODUCTION

The average cost per ton at mines on a permanently producing basis follows: For 1908, $2.71 to $3.19; 1909, $2.68 to $3.21; 1910, $2.56 to $3.34; 1911, $2.78 to $3.36; 1912, $2.44 to $3.46. These figures show that the

cost of production has not changed considerably during the last five years, although the maximum cost has gradually increased.

Water-freight rates to the chief cities are: From Ladysmith and Union Bay (Extension and Comox collieries) to Vancouver, 50c., including insurance; from Boat Harbor (South Wellington), 45c., insurance additional; from Seattle, Wash., 60c., and Tacoma, Wash., 70c. The rail rate to Vancouver from Merritt (Nicola Valley) is $1.80, and from Princeton (Similkameen), Crow's Nest (S. E. Kootenay) and Bankhead (Alberta), $3.50.

Vancouver Island coal mines, with one exception, sell lump coal at $4.50 the long ton. The excepted company employs U. M. W. of A. men and charges $4.75. These prices are at the mines. The Nicola Valley Coal & Coke Co. sells at $4.50 to $5 at the mine; the Princeton Coal & Land Co. at $3.50; Inland Coal & Coke Co. (Nicola Valley) at $4; Crow's Nest Pass Coal Co. at $3.25. All these prices are for screened-lump coal. Prevailing prices to consumers in Vancouver are placed at: Lump coal, $7.50; nut, $6.50; smaller pea, $5.25. Some of the companies charge slightly higher prices for various grades. Higher rates prevail for outside districts, owing to extra charges for delivery.

There is no unreasonable profit in any branch of the coal industry, so the commissioner thinks. Dividends have been paid by only three companies, and these have not in any case averaged more than 10 per cent., covering the period of operation.

The report is very voluminous, filling 90 pages. It will shortly be published.

Meeting of Canadian Mining Institute

The 16th annual meeting of the Canadian Mining Institute will be held at Montreal, Quebec, on Wednesday, Thursday and Friday, Mar. 4, 5 and 6, 1914. The meeting will be held at the Ritz-Carlton Hotel, Sherbrooke Street West, Montreal, and not at the Windsor Hotel as previously announced.

The Eastern Canadian Passenger Association has conceded special transportation privileges to members and their friends attending the meeting, based on the lowest first-class fare for the round trip on certificate plan.

The management of the Ritz-Carlton Hotel offers a special rate of $2.50 per day for a room with bath to members attending the meeting. The hotel can guarantee to accommodate 100 members only, and it is requested that those desiring reservations make application therefor without delay. Applications for accommodation may be sent to the secretary of the Institute, or to the manager of the Ritz-Carlton Hotel.

Provisional Program

Wednesday, March 4—10:00 a.m. to 1:00 p.m., presidential address, report of the council and election of council, 1914. Proposed amendments to sections 33, 34 and 35 of the bylaws (see page 14 of Bulletin of the Canadian Mining Institute, No. 23, January, 1914). Mineral statistics, 1913.

3:00 p.m. to 5:30 p.m.—Reading and discussion of papers relative to mining and metallurgical practice in the Cobalt district.

8:00 p.m.—"Safety in Coal Mines," (illustrated by cinematograph); "Hydraulic Mining," (illustrated by colored lantern slides) by H. W. DuBois, Philadelphia, Penn.

Thursday, Mar. 5—10:00 a.m. Excursion through Mount Royal tunnel under the leadership of S. P. Brown, chief engineer of the Canadian Northern Montreal Tunnel & Terminal Co., Ltd. and Dr. J. A. Bancroft of McGill University.

3:00 p.m. to 3:50 p.m.—Reading and discussion of papers relating to questions of mining efficiency and costs.

8:00 p.m.—Smoking concert. (At this function addresses and testimonials will be presented to certain prominent members of the Institute whom it is desired to honor. There will also be a moving-picture show, and a lecture on the International Geological Congress by Dr. F. D. Adams.)

Friday, Mar. 6—10:00 a.m .to 1:00 p.m.—Reading and discussion of papers relating to metallurgical subjects, including an address by Dr. E. D. Peters, Professor of Metallurgy, Harvard University.

3:00 p.m. to 5:00 p.m.—Reading and discussion of papers. (Miscellaneous.)

7:30 p.m.—Annual dinner.

The meeting and social functions will be held in the ballroom of the Ritz-Carlton Hotel. H. Mortimer Lamb, Ritz-Carlton Hotel, Montreal, is secretary of the Institute.

U. S. Coal & Coke Co.'s Filbert Mining Institute

The newly organized local miners' institute of Filbert, W. Va., held its first meeting Saturday, Jan. 24, 1914, at Filbert, W. Va., where is located the No. 9 plant of the United States Coal & Coke Co., of which Col. Edward O'Toole is general superintendent.

The institute was organized for the purpose of creating an interest among the workmen in their work, and in the night school, which is one of the many advantages which the United States Coal & Coke Co. offer their employees. Meetings will be held at regular intervals. Professor J. F. Drummond, who is in charge of the night school, was master of ceremonies, and very ably fulfilled his duties.

The following papers were prepared and read by the employees of the plant: "The Object of the Night School," by W. W. Harding, superintendent; "The Company's Live Stock; Uses and Abuses," by Emmett Graham, boss driver; "Setting Props," by C. B. Lee, assistant mine foreman; "Blasting Coal," by James Barrett, assistant mine foreman; "Motor Haulage," by Thomas Bingham, electrician; "Electrical Machinery; Uses and Dangers," by W. S. Jones, electrician; "Care of the Company's Property," by C. P. Clemins, outside general foreman; "Sanitation," by E. H. Dillman, sanitary inspector; "Coöperation of Foreman and Workman," by D. R. Gates, mine foreman; "Efficiency," by J. T. Basham, mine foreman; "The Results of the Night School," by N. D. Handy, carpenter; "The Advantages offered by the Night School," by C. C. Meeks, carpenter; "Mine Calculations," by Hubert Bingham, coal dumper. The last three men mentioned are regular members of the night school.

The papers were well prepared and well read, the "Safety First" thought being in each one. It was pleasing to note the interest being taken in the safety movement by the employees. After each paper was read, a general discussion was started and many interesting and instructive questions were asked and answered by those present. Professor J. F. Drummond and W. W. Harding, superintendent, who are always working to build up the night school, were much pleased with the success of the institute. Forty-seven members were present.

Operators and Miners of Central Pennsylvania Agree on Date for Meeting

The scale committee of District No. 2, United Mine Workers of America, will meet representatives of the Association of Bituminous Coal Operators of Central Pennsylvania at Dubois, Penn., Tuesday, Mar. 3. This meeting is called for the purpose of negotiating a new wage agreement. Patrick Gilday, of Morrisdale Mines, Penn., the president of the district, has tumor of the stomach which threatens to become carcinomatous.

Use and Abuse of Wood in Anthracite Mining

By E. E. Rueter*

SYNOPSIS—A considerable reduction in the cost of mining coal can be realized through giving closer attention to the mine-timber problem. Suggestions are made concerning the best time to cut and season wood. The selection of certain species of timber for use under particular conditions.

The enormous quantity of timber, poles, lagging, mine ties, plank and lumber in general used in anthracite-mine operations, makes this subject of great importance, and upon the intelligent handling of this material in the future will depend in a great measure the cost per ton output of coal.

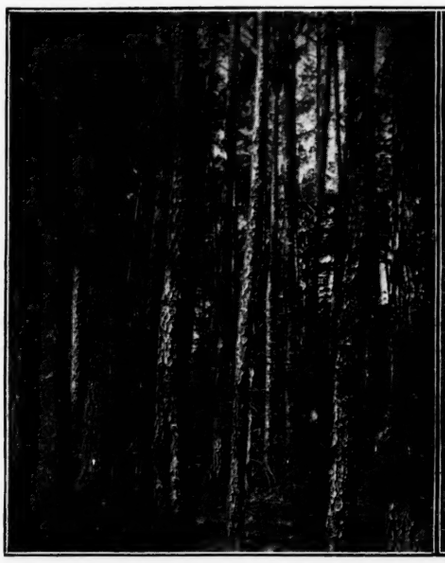


Fig. 1. Loblolly Pine on Eastern Shore of Virginia

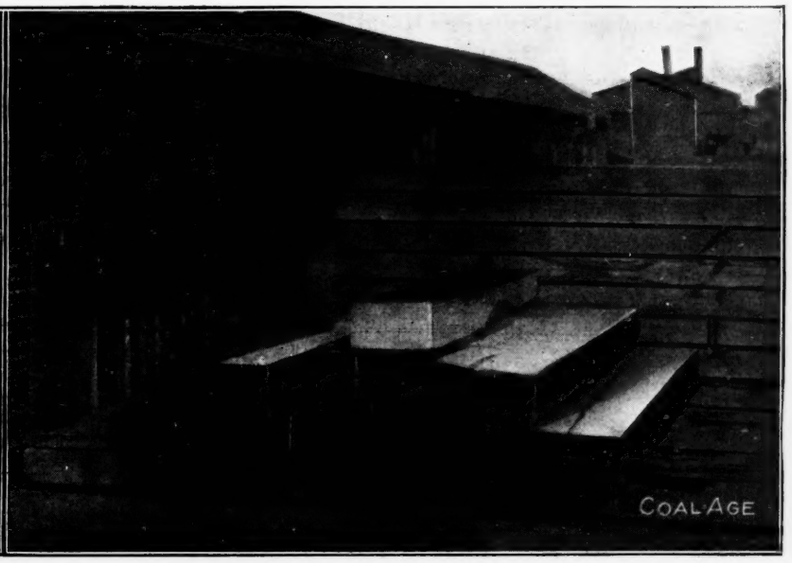


Fig. 2. Oak Timber Rendered Worthless by Improper Attention

Fig. 1. A good plan for coal mining companies to pursue, would be to make a thorough inspection of such timber tract from which they expect to get their supply, and in this way they may be more reasonably assured of obtaining healthy and suitable timbers for their mines.

Fig. 2. The five pieces of oak show the severe checks and the waste by rapid seasoning of oak car lumber or heavy timbers, cut from live timber in the summer season and exposed to the sun in hot weather; severe checking is the consequence, and oftentimes renders such pieces worthless. Winter cut and winter seasoning will to a large extent, eliminate this feature.

It may be possible that some of my conclusions are erroneous from a mining standpoint; however, it appeals to me, that the same methods found economical by other industries may also be advantageous to coal companies.

Although wood has been in universal use since creation, there exists a remarkable lack of knowledge as to its structure or subsequent behavior in its various uses, by those who might be expected to know its properties, thereby using species totally unfit for certain purposes, and consequently expensive to the company. In the past, when timber of all kinds was plentiful and cheap, it mattered little in many cases how long it lasted, as the service it gave was ample return on the cost; smaller quantities being consumed then, few thought it necessary to study the structure and behavior of wood before or after cutting from the stump, in order to lengthen its service.

Men of today do not receive the necessary training to acquire proficiency in their work, due largely to efforts to secure more lucrative or lighter employment. Consequently they do not serve a sufficient time to acquire the necessary knowledge of wood to know its species, quality or proper use and care. The newly hired man often is totally inexperienced and in many cases wastes more money than the amount of his wages.

Coal Companies Should Train Men

This subject is of sufficient importance for the management to seriously consider the adoption of improved methods in holding, and training their men to a point where they may know a diseased prop timber, affected with fungi or otherwise lacking the necessary vitality. Under such a system the life of gangway timber can be prolonged for several years at least, under general conditions in the mines so far as decay is concerned, thereby decreasing liability of crushing.

The cost of wood within 12 years has increased conservatively 25 per cent., while the quality is steadily decreasing. The greater care in the selection and use of wood is therefore self-evident, in order to lengthen its life by elimination of infected, or poor quality. The same care should be used in the selection of the proper species for various uses in and about the mines.

We should, therefore, use improved methods in selecting prop timber, mine plank and various other wood.

*Chief lumber inspector, L. C. & N. Co., Lansford, Penn.

Note—Abstract of paper read before recent meeting of Panther Valley Mining Institute, Lansford, Penn.

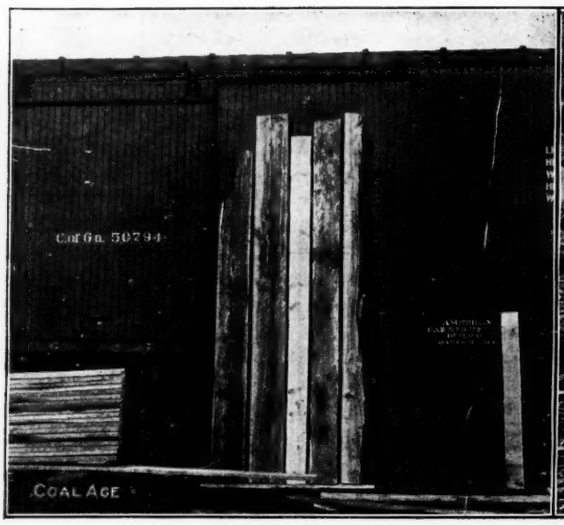


FIG. 3. SAMPLE OF ROTTEN RED-HEART PINE MINE PLANK

FIG. 4. ROTTEN RED-HEART SHORT-LEAF PINE LOGS

Fig. 3. Observe the shading of the planks. The middle piece being a sound plank, the four other pieces are rotten red hearts, known as such from the fact the wood so affected is softer than any other part of the wood surrounding it and of a dull deep brown color. Such plank are unfit for mine purposes, and should be rejected in all cases by the mining companies. There is danger in using same, as it has little strength and is liable through contact, to affect sound timber with decay.

Fig. 4. The four pieces in the foreground were split open to determine the extent of rot, and it should be noted that the heart zone comprising about one-half of the entire log in this case, is rotten red heart, caused by ground rot affecting the roots of standing trees with fungi. Ground rot is most destructive to timber from the fact that it is a case of interior rot, affecting the heart zone of the tree, and is not noticeable from the outside. Coal mining companies should reject timber which shows the least sign of rotten red heart on the ends of logs.

First, by determining the species meeting the most important requirements, or several qualities in combination as shown by actual experience, and tests. Second, the methods of procuring the supply. Third, the handling and preparation, and finally the placing in the mines, in which the same methods are apparently being used as were employed 50 years ago.

WHEN TO CUT TIMBER

Conceding that the present gangway prop material in healthy condition (such species as Southern short leaf, loblolly pine and spruce pine) is probably as good as can be secured at a reasonable first cost, the next question is, when, how and where to purchase same. In answer, I wish to state that in accordance with experience, timber cut between September and March is preferable to timber cut during the spring and summer months. Timber that is cut during hot weather is subjected to attack through a period when all insect life, such as worms, wood borers, beetles and other low plant life (fungus parasites) are most active in their work of wood destruction, and the timber during this period is in its most favorable condition, with fresh green sap, inviting attack of fungi spores and borers of all kinds, thereby causing

FIG. 5. LARGE LIMB KNOTS AND SWELL-END BUTTS

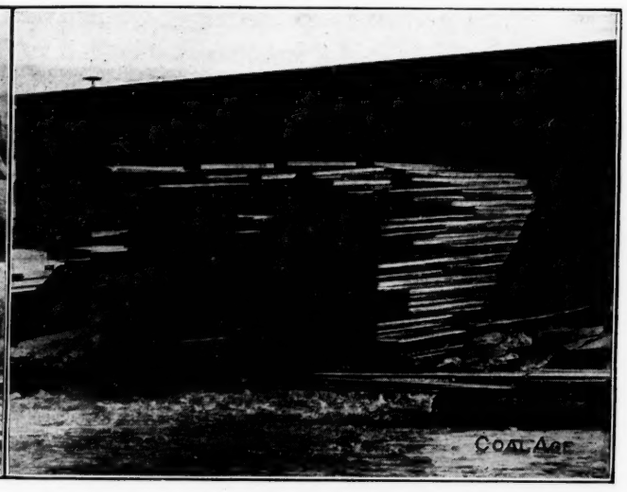


FIG. 6. RECKLESS UNLOADING AND PILING OF TIMBER

Fig. 5. These should be classed as bad manufacture, when shipped as gangway timber, especially when sold by the ton weight, such pieces are of various proportions usually having in the length of 27 ft., an extremely large diameter butt end and very small diameter top, consequently the stick is several times greater than an ordinary gradual taper piece of same top diameter would be, such being the case with the log lying on the ground in this picture.

Fig. 6. The haphazard manner of laying lumber on the ground in solid piles with chances of rain beating in through the crevices, and thoroughly soaking the pile is very injurious to the lumber, as in this condition it cannot dry out either by sunshine or air, and neither can penetrate a pile of lumber lying in this condition; consequently if lumber lies a long time in such a pile, it swells, stains with mildew from moisture, and becomes rotten.

the first signs of decay. Experience has shown that summer-cut timber does not give the satisfaction, nor will it give as long service as winter-cut stock.

It seems to me that the substantial and economical way to procure gangway mine-prop timber, would be for the coal companies to buy only winter-cut and peeled material, and pile it for slow seasoning, and hold in reserve for the succeeding year's work.

The company should draw on this reserve stock to suit its needs at all times throughout the year. It would place the matter of supply in its own hands, and enable shipments on a 30-day estimate for the succeeding 30 days' supply. Such an estimate should show the lineal feet of the various-diameter sizes required to build certain contemplated gangways and chuteways, during such period.

In this manner it would be possible to have an average 30-days' supply at each colliery wharf, with assurance that the stock is in its best condition for use and future stock reasonably assured.

What is true of gangway timber holds good in chute timber also. For greater economy, I would recommend the use of young white oak, instead of pine; white oak has greater strength and is more durable than pine where it comes in contact with soil, and it can be procured within a radius of 50 to 75 miles of the anthracite mines.

In recommending white oak, I do not wish to emphasize its superiority over long-leaf yellow pine, but it is a great improvement over short-leaf, loblolly and spruce pine, such as is now generally used. Black oak and red oak are approximately of equal value with short-leaf, loblolly and spruce pine, all of these being an easy prey of fungi, when in contact with soil, while white oak is of greater strength and durability. A white-oak plank, one inch full thickness, is equal to an inch and a half pine plank of equal width at an approximate decrease of $\frac{1}{3}$ in cost per surface foot.

Because of the use of heavy electric motors instead of mule haulage in mines, it is esential that improved provision be made to take care of mine tracks, by the purchase of mine ties, manufactured to a rigid specification, from live winter-cut white oak, chestnut oak and young chestnut properly seasoned before using, thereby reducing purchases and track repairs as compared to present methods of buying green ties of mixed woods and small sizes.

Sound pine trees cut down in the winter season and cut into log lengths, stripped of their bark and piled in layers with sticks between each layer, and piled up from the ground so that a free circulation of air can pass through the pile, will harden the exterior juices, thereby forming a coating which will, to a great extent, furnish protection from exterior checking and materially resist the attack of the fungus, spores and wood-destroying insects, which protection it does not have if cut during the summer season.

Winter Seasoning Is Best

Winter seasoning is slow, but slow seasoning is the proper method for heavy timbers, as rapid seasoning of green timber, especially in the summer season causes checks which may prove detrimental in its use for gangway props. Deep checks have a weakening effect, and afford avenues for fungus attacks to the interior of such timber.

Green and unpeeled pine timber placed in mines for gangway use is sure to give short service and minimum strength. Consequently such timber is the most expensive for the time service it renders. In such condition crushing is most liable and decay sets in quickly.

When the body of a pine tree is severed from its roots or stump, the bark is no longer of benefit to the wood portion. Only when a tree is cut for saw-log purposes, sawing same into boards or into dimension stock, is it needless to peel the bark, as it comes off with the saw slabs, consequently it is a saving to the sawmill man to the extent of time and labor it would require to peel the log by hand. Should, however, the log be left lying on the ground for any great length of time with the bark on, more especially if cut in the summer season, it furnishes a splendid harbor for wood borers and sap rot, thereby destroying a large part of the log, making it unfit for merchantable lumber.

A Saving in Freight

It is evident that in adopting a system of seasoning pine gangway prop timber, before putting same to use,

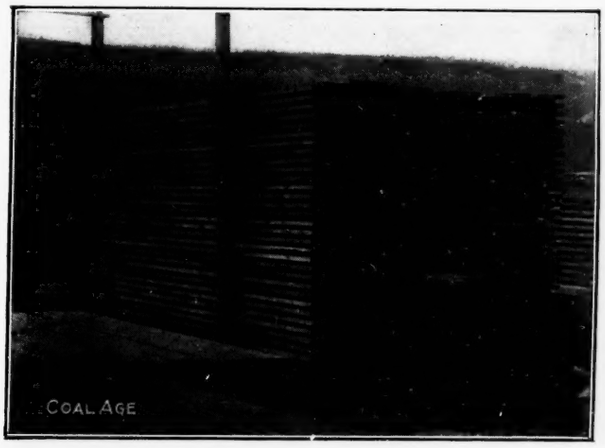


Fig. 7. Proper Way to Pile Lumber

Fig. 7. Lumber piled in this manner will improve by seasoning, the air can circulate from end to end, through the open space left between the boards of each layer. This method makes the pile practically water-tight, for each top layer acts as a roof for its neighboring layer. In this practice no cross sticks are required and the lumber will stay bright in color. The projecting boards on the end act as steps to the top of the pile.

it will mean for the first year an advance outlay of money of about 60 per cent. of the total cost of green timber, delivered on cars at the mines. This 60 per cent. covers the purchase price of timber, peeled and delivered on the ground at the loading points in eastern Virginia and Maryland. About 40 per cent. of the cost represents freight transportation charges, which would not become an outlay until such time when the lumber is seasoned and ready for use. Seasoning will require say, 8 to 10 months, in which time it will have lost 25 per cent. of its original green weight, consequently we have reduced freight charges to the extent of 25 per cent. through loss in weight by seasoning. This would mean about 60c. per ton saved in transportation, as railroad freight on prop timber from these points to Pennsylvania mines, averages about $2.40 per ton.

This 60c. per ton saved and applied toward the expense of seasoning and the outlay of 60 per cent. advance purchase money which represents cost of timber at loading point in green state, would more than cover the interest

at 6 per cent. on the invested outlay required while seasoning the first year's supply. After the first year the benefits that would accrue to the coal-mining companies would be so apparent through the use of seasoned prop timber, that the capital invested for seasoning would look very small compared to the benefits of longer life and consequent less consumption.

It may be claimed that to season prop timber it requires too much capital before use can be made of the timber; this is one of the arguments used by the coal-mining companies. The timber owner usually states in times of large demand that he can readily sell all he can supply in a green condition, and on account of limited capital he cannot stop to season, especially when same can be sold by the ton, green from the stump and unpeeled, receiving weight for the bark at the same price as for the wood. For the timber owner, this is the quickest method by which he can turn his timber into the most money; both arguments, therefore, are in favor of the seller, and quite expensive to the consumer.

In the handling of timber and lumber from the cars to the various timber wharfs, the rehandling and manufac-

FIG. 8. A CASE OF SAVING AT THE SPIGOT AND LOSING AT THE BUNG

Fig. 8. To allow a timber wharf to get into such a tangle can result in nothing less than waste, through breakage and unnecessary expense results in working the stock. The pieces of small sizes usually cannot be reached when wanted, therefore, larger sizes are substituted. This feature alone adds a charge of no small amount. We can safely figure a cost of $5 per working day for a team of mules and drivers to pull out of the tangle such timber as is needed for daily use. This does not include the time of workmen engaged in doing this work, the time of the men wasted in standing idly by to see the outcome of each attempt at pulling the props, nor the breakage caused by sudden pulls and drops. The logs lying on the ground frequently mildew, and decay sets in, if the props are there for any length of time.

ture into the various needed shapes and sizes, preparatory for distribution to mines, involves an item of cost of no small amount. Where this work is done by hand the cost is criminally expensive. The method belongs to the pioneer period of coal mining and should have been discarded years ago. If this feature had been given the benefit of progressive study and improved machinery and methods in line with progression found in other departments of mining operations, I am positive the results would have proved most satisfactory in showing decided reductions in cost per ton output.

As we look forward from year to year for increased coal production and keen competition compelling the devising of all means possible to reduce the cost of mining, it seems to me highly necessary to apply methods that will materially influence the quality and thereby the quantity of lumber consumed, using power-driven appliances instead of handwork, thus reducing cost and increasing capacity. As timbering is one of the first costs of mining and the annual amount involved in material and labor is very large, it would seem to me quite important to handle this feature along proved scientific lines, as to seasoning, handling, preparation and placing.

SHOULD DETERMINE THE MOST EFFICIENT SPECIES

Tests should be made to determine the most efficient species for each particular use, bearing in mind cost and service, specifications covering such needs should be prepared and purchases and inspection made accordingly.

Power-driven machinery should be installed for handling and manufacture. Men of experience only should be used in this work, thereby insuring proper returns for the money expended; as stated previously, an inexperienced man is likely to waste more than his wages on inefficient work.

Lastly we must have the hearty and intelligent cooperation of every man connected with the handling of this material, but more especially the mine foreman, and his assistants who have a large portion of the material under constant observation while in service.

Recent Legal Decisions

Excessiveness of Recovery for Death of Employee — It was decided that $8000 was not excessive recovery for the death of an electrician employed in a coal mine, in an accident attributable to the negligence of the mining company, if the man was 35 years old, had been in good health and was earning $85 monthly. (Indiana Supreme Court, Shirley Hill Coal Co. vs. Moore, 103 Northeastern Reporter 802.)

Liability of Railway Company for Shortage in Coal Shipment—In a suit against connecting railway companies for a shortage of coal shipped, it is held: "The carrier of goods is liable for all loss or injury not due to the act of God or the public enemy or the public authority, or to the inherent nature or qualities of the goods, or the act or fault of the shipper, and even in the expected cases a carrier may become liable, if by the exercise of reasonable care, he could have avoided or lessened the loss or damage. . . . . Where two or more carriers are involved and the shipper or consignee shows that a certain quantity of goods was delivered to the initial carrier and a less quantity was received from the delivering carrier, he makes out a prima facie case against each carrier, and it then becomes incumbent upon each to show that the loss or damage did not occur on its line, or, if occurring on its line, was due to some cause for which it was not responsible in law." (Kentucky Court of Appeals, Chesapeake & Ohio Railway Co. vs. Williams, 160 Southwestern Reporter 769.)

Validity of Employee's Release of Claim for Injury—An injured employee's release of claim on account of an accident does not bind him, if he was induced to sign it under misrepresentations as to its contents. (Kentucky Court of Appeals, New Bell Jellico Coal Co. vs. Oxendine, 160 Southwestern Reporter 737.)

Restriction of Coal-Yard Locations—That purely aesthetic objections to the location of a retail coal business in a residential district are insufficient to sustain a city ordinance or state law which operates to prevent such location, is the effect of a decision just reached by the Illinois Supreme Court, in the case of People vs. City of Chicago, 103 Northeastern Reporter 609. An ordinance in force in Chicago purported to prohibit the establishment of a retail business in a residential block, without the written consent of a majority of the owners of property on both sides of the street in that block. In declaring that the ordinance is void and unenforceable, the court said: "But even if the municipality is clothed with the whole police power of the street, it would still not have the power to deprive a citizen of valuable property rights under the guise of prohibiting or regulating some business or occupation that has no tendency whatever to injure the public health or public morals or interfere with the general welfare. An act of the Legislature which deprives the citizen of his liberty or property rights cannot be sustained under the police power unless the public health, comfort, safety or welfare demands such enactment."

Editorials

The Maximum Wage

The president of the United Mine Workers of America was given an increase in his salary of $1000 a year at the recent Indianapolis convention. The radical element tried to prevent this increase, and spent, it is said, $11,000 worth of time to fight it.

We can readily see the ground of their objection. An increased salary must be paid by the union, thereby impoverishing the workers. Nor is that the only reason, for, according to modern doctrine, a man should be paid not according to his merits, but because he is a man and has needs which he cannot otherwise supply. The operator has been made to pay the worst worker as much as he has been willing to pay the best; why should not the union follow the path it has blazed for others?

We look for a further development in thought along these lines, such that the various industries will join in condemning the raises in one industry which must ultimately be paid by those in all the rest. There will be the same feeling as pervades the men in a rowboat who are aggrieved at the wretched oarsman who cannot or will not pull a strong oar or who rests too often to spit on his hands. If, at any time, industrial enterprises are forbidden to make more than a certain profit, then probably the workers will be prohibited, possibly by their own organizations, from seeking more than an appointed wage. The sentiment to make this restriction has been strong in relation to the railroad trainmen during their recent strike. Of course, we cannot now advocate such a leveling of wage in the face of the fact that man is still in a degree a machine, of which covetousness is largely the motive power.

The American Federation of Labor is a body of men combined to increase their wages at the expense of one another, but the purpose is, of course, not understood by those who so combine, or there would be even more strife than is now exhibited in the conduct of its affairs.

The Bartlett Bill

An admirably contrived bill to exalt the farmer at the expense of the workingman has been conceived by the labor unions and the farmers and presented to Congress as House Bill 1873. We cannot see how any workingman can advocate it, despite the clauses giving laboring men the right to combine without violation of the Sherman bill.

It relieves the farmer from the possibility of prosecution under the Sherman Act. For the most part he has shown a readiness so far to make only our luxuries expensive. His strongest combines have been in tobacco and citrus fruits. But cotton is also largely controlled by the growers. It is the first real necessity of life to be put into a trust at the point of production.

The members of the labor unions have to buy farm products. They might not want them to be raised to an undue level. They may some day rue their attempts to combine with the farmers in removing the burden of the Sherman bill.

For the products which their labor produces cannot be protected by combinations even after the Bartlett law is passed. The farmers are both laborers and producers and therefore under this law not only is labor protected but capital authorized to combine and that capital is mainly engaged in producing staples of such importance that the workingman must starve if he would do without them.

We are in favor of giving both labor and capital the right to combine, but when this right is obtained it must be accompanied by legislation to keep all the organizations thus formed from running their business counter to the public interest. This the Bartlett law does not provide.

Canadian Competition

There are several reasons for not granting an increase to the miners at this time, but of these Canadian competition is not one. It is quite generally stated by the newspapers that the operators at Philadelphia have declared that owing to the menace of Canadian coal no increase can be given. We hope there is no truth in this statement because nothing can more surely alienate the public from the operators' position, nothing can make the mine workers more unreasonable in deliberation than forensic follies of this kind which are plausible but untrue.

The output of Nova Scotia coal was 7,619,357 tons in 1912 and it cannot be greatly increased whatever the demand. The coal is mined at considerable expense and is not of remarkable value. On the other hand, the Western conditions do not in any way affect the Philadelphia joint convention. No one really dreads what eastern Canada can do in the United States markets, so why urge it as an element of importance in framing a wage scale?

The Cost of Living

The cost of living always seems to be rising because our habits get more luxurious year by year. The needs of today are the extravagances of yesterday.

However, the indexes just lately have not shown an increase in the cost of living. In food commodities the maximum price of 25 articles, recorded by the *New York Times Annalist*, was reached in April, 1912, when the last scale was signed. The figure for that date was 152.-32. The corresponding value on Feb. 7, was 140.52. The fall is 7.8 per cent., which is sufficiently marked to justify its introduction as an argument in wage adjustments. It must be confessed, however, that fluctuation in the price of food stuffs is rapid, and in a degree difficult to forecast or rely on.

The Bradstreet index covers a much wider field of commodities, not being restricted to food. In December, 1912, it reached a maximum, but in the April pre-

ceding, it was figured at 9.0978. In January, it was 8.8857; the fall being 2.4 per cent. Of course, there is nothing surprising in the fact that the decline in the two indexes is unequal or in the statement that their maxima do not coincide in point of time.

Probably neither represent just what living costs the miner has to meet, but they do indicate that the present cost of living is not a good cause for an increased rate of pay.

We wish we could add to this statement the index numbers of the Department of Labor but we are informed by the Commissioner of Labor Statistics that these figures have not yet been completely compiled for 1913. These index numbers are of the utmost importance and should be ascertained with the rapidity of crop forecasts or otherwise they will not be available for use. The public is entitled to receive the facts without undue delay.

Recognition

It seems only right and proper at this time to ask: What is implied in the demand for "recognition" so urgently and persistently made by labor unions in general, but with marked pertinacity and daring by the United Mine Workers of America in particular?

That there is a legitimate use of this term, which may be understood to convey so much, no one will deny; but just as certainly is it true that the use to which it has been put by labor organizers is both unfair and unequal.

Recognition is to be earned, not demanded; it is the ripened fruit of toil, labor and industry. It comes naturally as the result of accomplishment. There must be something to recognize in order to gain recognition.

In the recent Mexican crisis the usurpers of governmental authority had no claim to recognition by other established governments, because their assumed authority was not sanctioned by the free vote of the people to be governed. Whom the people recognize by their free vote as their chosen leader may safely be trusted and recognized by others.

But, in regard to the incessant demand for "recognition" made by labor leaders, the question may properly be asked: From whence does this call arise; what is its source and what the need? In attempting to answer these questions, we observe, first, that labor has the same right to organize and can justly demand the same recognition by other authorities as other organizations receive, provided only it is the free act of the parties concerned and not the work of agitators.

Free organization grows out of a *common necessity;* its aim is the *common good.* The principals to the action are the rank and file of the men—the workers and not their paid emissaries. An organization of workers commands respect on every hand and becomes a recognized power, because its interests are strongly allied to the industry the workers represent.

The history of the United Mine Workers of America reveals an enforced enlistment of men whose numbers, even then, fall far short of a majority of the mine workers. The methods employed to induce a strike vote have shown repeatedly the intimidation and coercion of the many by the few. The truth of these statements is proven again by the record of the strike condition that has existed during the past 18 months, in the Island of Vancouver.

When the efforts of the paid organizers of the U. M. W. A. failed, after months of unceasing labor, to secure a sufficient enrolment among the miners on the Island, and, as a consequence, failed to secure a strike vote at a mass meeting called twice in succession, they prevailed on a sufficient number of men to stay out of the mines, ostensibly for a "holiday," which so demoralized the working forces that the "holiday" virtually was extended and formed a condition analogous to a strike, though the declaration of a strike would have made those responsible for such act amenable to the Canadian law, which forbids strikes or lockouts, pending an inquiry by an impartial board for the purpose of adjustment of the trouble.

In the Vancouver Island difficulty, the trouble was entirely the work of paid labor agitators, whose ultimate purpose was to secure the *recognition of their organization* by the coal operators on the Island. Could such a proceeding be regarded as anything but unreasonable and unworthy of consideration by true workmen? Will mine workers continue to tactily indorse such policies and allow a few paid agitators to create and bring about a condition that deprives men who desire to work, of the opportunity to do so? How long will the large majority of honest mine workers, who recognize and appreciate all that is being done by their employers to improve the conditions of mining, permit a few demagogues to control them and destroy the dignity of labor? Let the honest miner stand for his right to labor unmolested and unannoyed by the idle trouble-maker.

Fanning the Air

The object of a paper devoted to any great industry is not to modify the attitude of the workingmen who do not read it, but rather to act as a directing force for its own subscribers. Much would we like to do something to correct the wrong economical attitude of labor and to give it a due sense of its moral obligations, but in this we have our limitations and we must confine ourselves to the work we are able to perform.

Most papers are fanning the air. The average technical journal fails to criticize its readers whom it might well hope to help, and it abuses all other people who are not likely to profit by such maledictions, and strange to say, we do not believe either workingmen or operators want slavish mouthpieces to utter their more reactionary moods.

If they do they are less honorable than the monarchs of past centuries, who kept private confessors to tell them of their sins and zanies to upbraid them with their follies, giving due heed to both.

We have been pleased to note that a daily which has made much capital out of its attacks on the anthracite companies, and which is read almost entirely by the proletariat, gives much space in its columns to urging sobriety, energy and responsibility to employers on its *clientèle.* We do not note that it has suffered by so doing, and we are positive on the contrary that such a course promises it a large measure of success.

The future of the world is indeed safe. Virtue and altruism are not dead and an honest attempt to tell the whole truth is far better and even more profitable to either a technical paper or a daily than a patronizing defence of its supporters and a spectacular abuse of those who are unconscious of its attacks.

The Philadelphia Conference

SYNOPSIS—The operators and miners are confronted with prosecution for violating the Sherman Anti-Trust Law should they conclude an agreement. After a period of indecision, the operators demand a readjustment of the machine differential in Illinois and Indiana, the abolition of the check-off, the formation of a conciliation board, the incorporation of a penalty clause in the coming contract, and the exclusion of mine officials from the Union.

The operators and mine workers of the central bituminous competitive field met on Feb. 10 at the Bellevue-Stratford Hotel, Philadelphia, Penn., to arrange a new scale of wages. The convening parties come from western Pennsylvania, Ohio, Indiana and Illinois. District No. 2, of central Pennsylvania, centering around DuBois, is not taking part in this conference, and will make a separate, but not, of course, an independent, agreement.

The Conference Organizes

The operators held two meetings on Feb. 9, in preparation for the joint convention. This meeting was called to order by John P. White, president of the United Mine Workers, at 4 p.m., Feb. 10. There are eight operators and eight miners from each of the four districts: No. 5, western Pennsylvania; No. 6, Ohio; No. 11, Indiana; No. 12, Illinois. W. L. Schmick, president of the Illinois Coal Operators' Association, was chosen president, William Green, secretary-treasurer of the United Mine Workers, secretary, and John Zelenka, commissioner of the Eastern Ohio Operators, assistant secretary.

Threatened with Prosecution

At first the operators appear to have been afraid to act, owing to the threat of the West Virginia mine owners to bring suit should the agreement between the contracting parties be renewed. The operators of that state are aggrieved because the funds collected by the Union in the competitive states have been expended for the maintenance and support of union men in West Virginia. For a while it looked probable that before the end of the week the meeting would adjourn wholly without result, with a possibility that it might never reassemble till a legislative enactment made that action less risky.

The second day, Wednesday the 11th, was given to indecision. The operators made no reply to the miners' demands, the actual wording of which is given in our issue of Feb. 14, on p. 292. In the afternoon the opposing parties went into conference again.

The Board of Conciliation

On the third day the operators introduced their proposition for the creation of an arbitration and conciliation board:

We are in favor of adopting some plan by which in these and future negotiations the directly opposite views and demands of the miners and operators can be settled without entailing strikes and suspensions, which, of necessity, are injurious to the public, detrimental to the best interests of both miners and operators, and too often are forced agreements, rather than contracts based on justice and equity.

The proposition of the miners, as presented by President White, does not remedy the situation, but only puts off the inevitable to an uncertain date, and absolutely places the operators and the public at the mercy of the miners' organization, which has the power to suspend operations at any time that may be to its advantage or convenience. The miners' proposition leaves no option to the operators as to when or how such strike or suspension shall or may be called.

As a counter proposition, and one that will absolutely settle these disputes for all time, we recommend the following joint resolution: We agree that in these and all future negotiations when no settlements have been reached prior to the expiration of the existing wage agreement, all questions and controversies shall be submitted without restriction to an arbitration board, both parties agreeing to abide by the decision of such board, and the union contracting that pending the final decision of such arbitration board, the miners shall continue to work on the basis of the terms of the expired contract.

The miners' proposition, which is here mentioned, is that they continue work pending a settlement. The conciliation board proposed by the operators, having a representative from the Department of Labor, would have an official standing and largely offset the objections of the Sherman Anti-Trust Law.

Six Eminently Fair Demands

On Feb. 12 the mine workers and operators met in the morning and afternoon, but without result. Then an executive meeting of the operators took place. On Friday, Feb. 13, the operators made the following statement and offer:

In view of the fact that the wages paid to the miners in the competitive coal-mining fields of western Pennsylvania, Ohio, Indiana and Illinois are the highest paid anywhere in the world, and that the general conditions of the country call for a decrease of the present scale of wages rather than an increase, and also that further relief has been promised by the government in the cost of all necessities, and, furthermore, that the consumers of coal, both for power and domestic use, must, for the general welfare of the public, be supplied at a reasonable price, we offer the following:

That the Cleveland agreement now in effect be extended for four years ending Mar. 31, 1918, with the following additional provisions and exceptions:

First—In entering into an agreement the rights of the employers and of the owners of property must be recognized, and these rights can only be modified or abridged by the specific terms in such agreement stipulated.

Second—The machine differential in Illinois and Indiana must be adjusted on a basis that will be more favorable to the operators of those states.

Third—The so called check-off, or collection of dues or assessments, which the miners' union has heretofore levied or assessed and collected through the operators shall not be included in any contract which will be made.

Fourth—A court of last resort, to which disputes shall be taken which threaten the suspension of operations shall be established, to the end that the altogether too prevalent and notorious practice of the local and state bodies, of enforcing settlements on their own terms in violation of the provisions of the agreement, may be avoided.

Fifth—Penalties in the form of stipulated fines shall be provided for violation of contracts by either party when properties are closed down in violation of the agreement.

Sixth—For the protection of life and property, the operators' right to employ such supervising officers as they may deem necessary shall not be questioned, and these officials shall not be dominated by the United Mine Workers in any manner.

Less Diplomatic Chicane, More Arbitration

Of course, no conclusion was reached. The miners continue to stand out against the operators for an increase. This situation will exist every time a contract is made until there is a recognized basis of settlement. Some Grotius should arise on either side who would write "The Laws of War and Peace," and endeavor to bring order out of chaos.

Obviously, when the cost of living is lowered or unchanged, there is no basis for an increase, except a small

increment based on the increased unit output of other workers, when unaccompanied by an increase of efficiency in the labors of those asking the raise in wages. But it must be confessed that the logical position of the operators is somewhat weakened by the fact that when such an advance in the price of living has been clearly in evidence, they have asked for a decrease. The way to make a customer hang for his price is to get a reputation as a merchant who always asks for all he can hope to get, and who has always another card up his sleeve. This time the operators have not done this, to their credit be it said, but past history still dogs their steps.

The Mine-Run Provision

Of course the operators cannot wholly agree among themselves on the anti-screen provision. The subject merits most careful consideration. If they are going to concede the change, the new basis for payment becomes most important. The new method should be based either on what other mine-run states or districts are paying, or on the equivalent of the present rate in the past year, as determined by a committee of the Geological Survey or the Bureau of Mines. By all means let it be a governmental body, so as to make the charges of chicanery less likely.

The basis of settlement, if not in arbitrary agreement with the scales in mine-run states, should be the relative sizes of the coal mined in 1913, so that there will be no chance for the miners to make large coal during the test in order to raise the rate of compensation for mine-run to the level of lump coal. The change in scale will probably be in favor of the machine-mine operators, for they are doubtless getting less slack in exchange for the high price they are paying for lump coal than the hand-pick mine owners. This change will help the machine differential, which is smaller than it seems, because of the fact that the machine-mine operator often receives, without payment, less slack coal than his hand-pick mine competitor.

The Export Trade

The *Colliery Guardian* (London) makes the following editorial comments on the British export trade in 1913:

Let us take now a rather less distasteful subject—our distant markets. Here again the returns are rather unequal. To Brazil we sent 250,000 tons more than in 1912, and to the Argentine 300,000 tons more, but in Chili we barely retained our position whilst to Uruguay we have sent 150,000 tons less. To British India, Hong Kong and the French dependencies shipments have increased materially, but, speaking generally, there is no great change, and in some markets, such as Cuba, Mexico, Peru, Sierra Leone, Aden, Ceylon, Canada, Bermudas, the Falkland Islands, the Azores, Madeira, Portuguese West Africa, Italian East Africa and Japan, the returns are actually down.

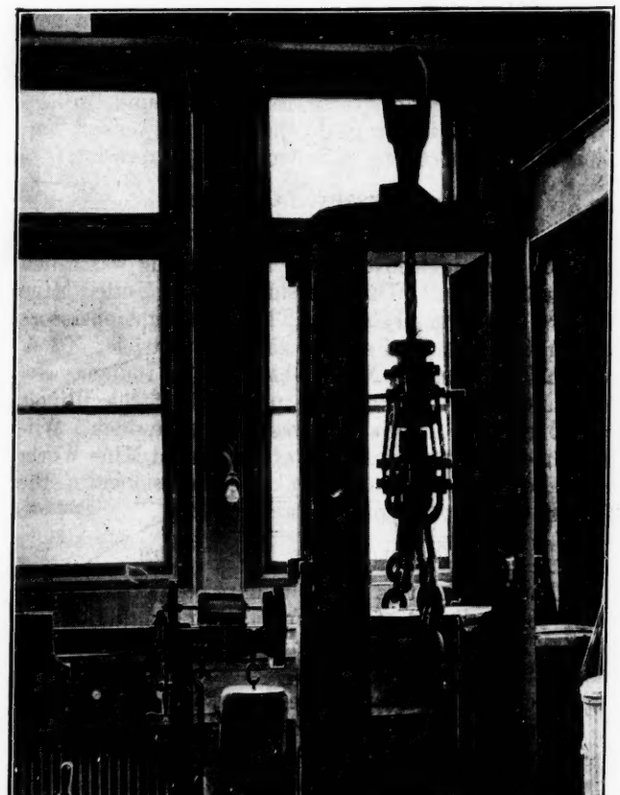
As regards the bulk of trade, these markets may take second rank, but it is not altogether cheerful reading. It is remarkable that, in a year in which shipping has been exceptionally busy, our exports to coaling stations like the Canaries and the Azores show no increase, and that this tendency is also observable in the more distant entrepôts.

The opening of the Panama Canal, in these circumstances, must naturally cause concern. In the United States, last year, still greater attention has been paid to the possibilities of foreign markets, and many of the largest firms have sent agents far and wide with the object of cultivating trade. The returns for the year give little sign of this stimulated interest, but that it will make itself felt in the near future, not only in South America and the Far East, but also in South Europe, is manifest. In the 10 months ended with October, the exports of American coal amounted to 15,543,656 tons, as against 12,395,776 tons in the same period of 1912. Much of this is due to increased shipments to Canada—a market closed to British coal—but the 240,000 tons sent to Brazil and 161,000 tons sent to the Argentine represent practically new business. It is in our bunker trade, however, that the competition of American coal is most greatly to be feared.

A New Safety Cable Grip

A new safety cable grip which appears to have considerable merit has been invented by Mr. Colin Methven, of Herminie, Penn., hoisting engineer for the Keystone Coal & Coke Co., of Greensburg.

A test of this grip was conducted at the Pittsburgh Testing Laboratory on Nov. 20, 1913. At this trial, neither the grip nor cable were tested to destruction, but



The Cable Grip under Test

links of a 1-in. steel chain with which the device was held were considerably elongated. The test load placed upon the grip was 68,400 lb.

It is confidently believed that this cable grip which is designed for cages, slopes and elevators, will stand an ultimate stress of 40 tons before giving way.

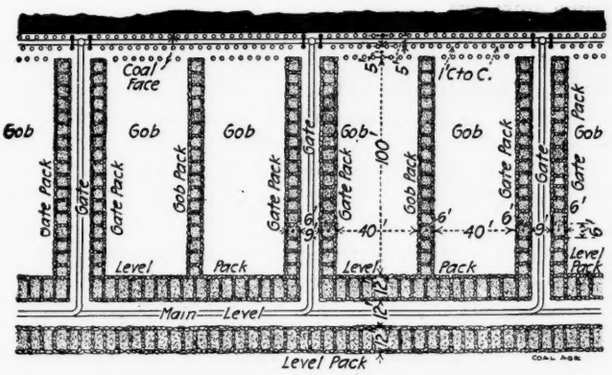
The accompanying illustration shows the device, which is supposed to go upon the cable 3 ft. above the socket, as it appeared under test in the testing machine at the Pittsburgh Laboratory.

Discussion By Readers

Longwall Mining Methods

Letter No. 3—Replying to the inquiry of "Bituminous," COAL AGE, Jan. 31, p. 219, the following is what I consider the proper method of timbering and cribbing, and the general arrangements to adopt when working a longwall face 300 ft. or more in length. The roof being a hard slate overlaid with sandrock should, in my opinion, prove to be an ideal roof for longwall work.

As shown in the accompanying sketch, there should be provided one "gate" or roadway for each 100 ft. of face. These gates (roads) should be 9 ft. wide, with a stone



LONGWALL MINING, SHOWING USE OF GOB AND ROADSIDE PACKS

pack 6 ft. wide on each side of the road. There should also be a gobpack 6 ft. wide carried up halfway between each gate and the one next following. This arrangement will leave about 40 ft. of open gob or storage space between each gatepack and the gobpack.

The main level should be about 12 ft. wide with a stone pack 12 ft. wide on each side of the level. A crosswall should be built every 6 ft., in all packs. Two feet of roof should be shot down in the gates or roads and 3 ft. of roof taken down on the main level. This brushing, together with the waste material from the seam, if any, will generally provide all the dirt necessary for building the packs. On no account must timbers be left standing within these packs, or they will bend and push out the packwalls when the weight comes on them.

Posts must be set every 4 ft., in rows along the face of the coal, as shown in the sketch. The rows should be 5 ft. apart. There should never be more than three rows of posts standing at one time at the face. These posts should be arranged in the following order: One row in the gob and a row of posts on each side of the face track. If the timbers are set in this manner regularly, they will take care of the slips in the roof. A footboard, say 2 in. thick, placed under each post, will often prevent the breaking of the post.

Whenever the roof shows a tendency to break, wooden cribs should be set along the face of the coal or on the gob side of the track. Instead of the wooden cribs, "wood packs" are sometimes used where sufficient material, preferably oak, 8x8 in., 2 ft. long, can be secured. These packs should be set on a few shovelfuls of fine dirt, which will enable them to be drawn easily. All posts and wood packs must be drawn and not allowed to remain in the gob, so as to make the gob the point of least resistance and assist the roof to break in the gob instead of at the face of the coal.

A crossbar should be set on each side of each gate, at the face and at right angles to the same, as shown in the figure. The face track goes under these crossbars, and the latter will support the sides of the gateway when shooting down the roof. They must be taken down as soon as the gate sidepack is built, which, of course, would be after all coal has been loaded out of the last mining and the face of the coal has been again cut.

A most essential feature in longwall work is that the face must advance rapidly and uniformly. Trouble will always result if this is not done, as the roof will fall at the face. I shall be pleased to give further information if desired.

HARRY MARSON.

Piney Fork, Ohio.

Letter No. 4—Replying to the inquiry in reference to longwall mining, COAL AGE, Jan. 31, p. 219, I may say, though I have not worked in Pennsylvania or in the Pittsburgh district, I am familiar with longwall work under conditions similar to those described by correspondent. I have worked under such conditions for many years.

Under the conditions named in this inquiry, with slips running at right angles to the coal face, I do not think it wise to set the props on mounds of dirt. The roof often "weights" so suddenly that a timber resting on dirt would be swung out of line and allow the roof to fall, perhaps, hurting or killing the miner. A better plan, when it is desired to ease the weight on the timber, is to taper the end of the prop. Then, when the weight comes on, the tapered end of the post will curl up or "mop," which will have the same effect as when the post is set on dirt.

The most dangerous feature, in working under a roof containing slips, is the frequent or occasional occurrence of false slips, which are unexpected, and cause large portions of the roof to drop without warning. I believe there have been more lives lost from this cause than from any other one cause in mining. I think a good plan, under such conditions, is to drive the center of the place slightly in advance, which will often reveal the presence of such false slips in the roof, in time to avert the danger.

WILLIAM JAMES,
Mine Foreman.

Mystic, Iowa.

Letter No. 5—I was particularly interested, in reading Letter No. 1, on longwall-mining methods, by Charles Waine, COAL AGE, Jan. 10, p. 99, and noted that, notwithstanding his experience and knowledge of the subject, he unfortunately dealt with the matter in a short and general way.

When mining seams of coal varying in thickness from 3 ft. to 6 ft. 6 in., such as Mr. Waine describes, the character of the rock immediately overlying the coal to a height of 25 or 30 ft. must be carefully considered. On the character and condition of these strata immediately above the coal and that of the bottom of the seam will depend, to a certain degree, the number of rows of chocks, cribs and timber supports; and the same conditions and depth of cover will determine how far apart these should be placed. All so called slate, shale and sandrock are not homogeneous in texture, and do not break alike in every locality. At times, the roof breaks easily, before the opening in the coal is widened to its full extent and generally starts to cave near the middle of the opening.

In longwall work, before the first break occurs, or the opening has reached its maximum width, it is invariably noticed that the coal face is more or less depressed, owing to the enormous weight of the superincumbent strata supported above the opening. After the break occurs, this immense weight is carried forward by the overarching of the strata, and rests on the collapsed material on one side and the solid coal on the other side. The portion of weight thrown on each of these supports depends largely on their relative elevation or the inclination of the seam, the greater elevation taking the less weight while the major portion of the load rests on the lower side.

A little study of this condition makes clear that the coal face must not only sustain the weight of the strata perpendicularly above it, but must also bear its portion of the weight due to the overarching of the solid strata; and, lastly, bearing more directly on the face of the coal is a portion of the weight of the hanging rock, often called the "underburden." The timbers, chocks or cribs placed along the face serve only as auxiliaries to support and regulate the amount of this last load or underburden thrown on the face and which serves to break down the coal.

It is important to notice that when the roof breaks easily and is not of massive structure, more than two rows of timber supports will not be needed, for the reason that an unnecessary load would thereby be thrown on the face and crush the coal. When the roof rock, however, is massive, and does not break readily over the timbers or cribs, the number of rows of timber supports must be increased. In this case, the weight of the underburden acts on the coal face similarly to a cantilever. In that case, if the number of rows of timber supports are reduced from four to three or from three to two, the weight thrown on the timbers may either displace them or depress them and too great a weight will then be thrown on the coal face. If the cribs or timbers are greatly depressed, it will often happen that the roof will break off at the face of the coal instead of over the rear timbers.

JAMES T. WARD.

Scalp Level, Penn.

Working Coal under Water-Bearing Strata

Letter No. 5—Replying to the inquiry of George MacPhail, COAL AGE, Jan. 3, p. 30, it may be assumed, from the data given, that this is a flat seam, and that the strata underlying the hardpan shown in his vertical section, are practically unbroken over a large area surrounding the shaft. But, as all rock strata are more or less porous and traversed by joints and cracks, the water of lakes and rivers as well as surface drainage will find its way into the sandrock below. It may be inferred, therefore, that this sandrock is the natural reservoir for whatever water percolates through the overlying strata, besides forming the natural underground drainage channel for the entire country through which it extends.

In answer to Mr. MacPhail's first question, then, I would say, since the sandrock underlies such an extended area and assuming there is little or no inclination, it would be reasonable to expect the same flow of water from each of the first breaks made about the shaft, as what finds its way into the shaft. As the work advances, however, and new breaks are made, the flow from each new break may be somewhat reduced, although the total flow of water into the mine will be naturally increased as the workings are extended in the development of the mine. The flow of water will largely follow the line of new breaks and the shaft and intervening space will not be troubled with as much water and may frequently become quite dry.

In reference to the second question, I would say, since the fireclay, slate and shale underlying the sandrock, attain a minimum thickness of 30 ft. in places, and the maximum pumping capacity is 1200 gal. per min., it would be advisable to leave 50 per cent. of the coal as pillars for the support of the surface, and to adopt a suitable method of mining to make sure that the water-bearing strata will not be broken.

In answer to the third question, considering the above assumed conditions, and from the data given in the inquiry with reference to the flow of water into the air shaft and drill holes, I would naturally expect as large a flow of water into the hoisting shaft, as was encountered in the air shaft.

BENJAMIN HARTILL.

Johnstown, Penn.

Results in Discussion

Letter No. 3—I read with interest the letters of G. M. Shoemaker and John Rose, COAL AGE, Jan. 17, p. 135, entitled Results in Discussion. Although these letters leave little to be said in regard to the value of discussion, I desire to add a few remarks commending the spirit of friendliness that has pervaded the various letters submitted on the many questions that have come before the readers of our paper.

I have noticed, in reading many of the discussions conducted in other papers and magazines, that the writers often indulge in personalities to such an extent that one finds little interest in reading their letters. In many instances, the interest of the reader is lost and his ideas confused by a mass of argumentative statements that have little bearing on the question under discussion.

On the other hand, I have been much impressed with the manner in which the correspondents in COAL AGE have evinced a get-together spirit, showing a desire to serve the general good rather than to combat an honest opinion expressed by another. Where criticism has been made it has been expressed in such a kindly manner and the ideas advanced in such a coöperative spirit, that our "Discussion by Readers" is much like a family discussion—the COAL AGE family.

GEO. N. LANTZ

New Straitsville, Ohio.

High Safety Records

In reading the account of the banquet, recently held by the United States Coal & Coke Co., at Gary, W. Va., COAL AGE, Jan. 31, p. 205, I was much interested in the output record per fatal accident, as shown by papers read at this banquet.

The accident record of the U. S. Coal & Coke Co. is good, and the rapid strides they are making in decreasing accidents is exceptionally good; but, let me say, before they can realize their "fondest desire" of having "the safest mines in the United States," they will have to go some. There are many companies with better records, and one in particular is the Cambria Steel Co.'s mines in and near Johnstown, Penn.

During the year 1913, the Cambria mined 1,500,854 tons of coal, with only one fatal accident. Over 1,300,000 tons of coal were mined before this accident occurred, and every effort was being made for a clean record for the year. The most disheartening feature of this fatality was the fact that it was not a pure accident, but resulted from the miner's own neglect to protect himself from a known danger. He was an experienced miner, having worked nine years in pillar work. In this case, he had been warned of a bad piece of top and instructed to place a timber under the rock before attempting to do any more mining. The timber was sent him in the first car going to his place; but, instead of standing the post where it was needed, he removed it from the car and was loading the car when the rock fell.

Cambria's best year, previous to 1912, recorded nine fatal accidents. During 1912, the fatalities were reduced to three, which was a little more than a half-million tons for each fatal accident. The record for 1913 shows but one fatality for over a million and a half tons. It is a record of which, I believe, we may justly be proud. There are, perhaps, companies who hold better records and, if so, I would like to hear from some of them through COAL AGE.

Johnstown, Penn. CAMBRIA.

[In connection with the above we are glad to receive the following inclosure from C. M. Schwerin, general manager, Vinton Colliery Co.:

To the Officials of the Vinton Colliery Co.,

Gentlemen—I want to congratulate the officials of the Vinton Colliery Co. on their success in keeping down the number of accidents for the year 1913. With a production of over 400,000 tons of coal and in the manufacture of coke there is only one accident recorded, and that a flesh wound to a boy employed outside the mine. This shows an excellent record.

JOSEPH WILLIAMS,
Mine Inspector.

We shall be glad to receive other high safety records, as the honest and fair competition in the race for SAFETY will do much to improve mining conditions.—ED.]

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Example—It is proposed to open a mine in a 6 ft. seam of coal and provide for a capacity of 1000 tons a day. A general estimate is desired of the requirements for the proper ventilation of the mine, under working conditions. In other words, what volume of air will be required and what will be the approximate water gage and horsepower necessary for the circulation of such quantity in this mine?

Solution—Assuming an average daily output of 2.5 tons of coal per miner, the number of miners working will be $1000 \div 2.5 = 400$. Then allowing for, say 150 helpers and 50 company men including bosses, the total number of men in the mine will be 600, for whom the quantity of air specified by law must be provided.

Assume that the mine generates considerable gas and to cover all requirements, estimate on supplying 200 cu.ft. of air per man, per minute, which gives a total required air volume of $200 \times 600 = 120{,}000$ cu.ft. per min..

In order to estimate approximately what water gage will result in the circulation of this quantity of air, it is necessary to decide on the size of the entries; and from the sectional area thus determined and the safe maximum velocity of the air current in the cross-headings or splits, find the number of splits required to meet these conditions.

In this case, suppose all entries to be 6x10 ft., giving a sectional area of 60 sq.ft.; and the mine being gassy, say the velocity of the air current on all cross-headings or splits must not exceed 360 ft. per min. This condition will require a total area of passage or the sum of the sectional areas of all the splits, $120{,}000 \div 360 = 333$ sq.ft. But the area of the entries being each 60 sq.ft., the number of splits required to give this area of passage and thus keep the velocity of the air currents in the splits within the specified limit is $333 \div 60 = 5.5$, say 6 splits or pairs of cross-headings.

The next step is to decide on the distance each pair of cross-headings will be driven, from which the extent of rubbing surface can be approximately estimated. For example, assume the cross-headings to be driven, say 2000 ft. on each side of the main heading, making 4000 ft. of entry, including the return, in each split. The total length of entry for the six splits is then $6 \times 4000 = 24{,}000$ ft. For the main headings, assume a double pair of entries, so as to provide two intake haulage roads affording separate tracks for the empty and loaded trips; and two return airways.

If the cross-headings are turned to the right and left of the main headings, every 400 ft., the length of these headings may be taken as $3 \times 400 = 1200$ ft., giving a total length for these four entries $4 \times 1200 =$ say 5000 ft. The total length of all entries in the mine may thus be assumed as $24{,}000 + 5000 = 29{,}000$, or, say 30,000 ft.

The estimated rubbing surface is then $s = 2\ (6 + 10) \times 30{,}000 = 960{,}000$ sq.ft.; and the mine potential is

$$X = \frac{6a}{\sqrt[3]{ks}} = \frac{6 \times 60}{\sqrt[3]{0.00000002 \times 960{,}000}} = 1344$$

This is only an approximately correct value for this mine, because the six splits do not start from the shaft bottom.

The Coal Age Pocket Book

The **water gage** required is then calculated from the mine potential and the air volume; thus,

$$w.g. = \frac{Q^2}{5.2X^3} = \frac{120{,}000^2}{5.2 \times 1344^3} = 1.14 \text{ in.}$$

It will be safe to assume, from the above calculation, that the proposed mine can be properly ventilated by the circulation of 120,000 cu.ft. of air per minute under a water gage of, say 1.5 in., providing for six main air splits as described, and making due allowance for possible conditions.

The **horsepower** required to produce this circulation, assuming a general efficiency of K = 60 per cent. is

$$H = \frac{Q\ (5.2\ w.g.)}{K\ 33{,}000} = \frac{120{,}000\ (5.2 \times 1.5)}{0.60 \times 33{,}000} = 47+, \text{ say } 50\ hp.$$

Example—Find the unit pressure, water gage and horsepower required to circulate 80,000 cu.ft. of air per minute in a mine in two equal splits. The airways are all 8x10 ft., and have a total length of 12,000 ft., including the return airways.

Solution—The sectional area of the airways, in this case, is $a = 8x10 = 80$ sq.ft.; the perimeter is $o = 2\ (8 + 10) = 36$ ft. The potential of the airway for two splits is then

$$X = \frac{2a}{\sqrt[3]{klo}} = \frac{2 \times 80}{\sqrt[3]{0.00000002 \times 12{,}000 \times 36}} = 780$$

The unit pressure is

$$p = \frac{Q^2}{X^3} = \frac{80{,}000^2}{780^3} = \text{say } 13.5\ lb.\ per\ sq.ft.$$

The corresponding water gage is $13.5 \div 5.2 =$ say 2.6 in. The horsepower on the air, as calculated from the above unit pressure, is

$$H = \frac{Q\,p}{33{,}000} = \frac{80{,}000 \times 13.5}{33{,}000} = 32.7\ hp.$$

Or, the horsepower may be found directly from the mine potential, as follows:

$$H = \frac{1}{33{,}000}\left(\frac{Q}{X}\right)^3 = \frac{1}{33{,}000}\left(\frac{80{,}000}{780}\right)^3 = 32.7\ hp.$$

Example—Find the quantity of air in circulation in four equal splits in a mine, when the size of the airways is 5x14 ft. and the total length of airways in all the splits, including the returns in each case, is 40,000 ft.; the water gage at the shaft bottom where the air is divided being 3 in.

Solution—The rubbing surface, in this case, is $s = 40{,}000 \times 2(5 + 14) = 1{,}520{,}000$ sq.ft., and the sectional area of each airway $5 \times 14 = 70$ sq.ft. The mine potential for four splits is then

$$X = \frac{4a}{\sqrt[3]{ks}} = \frac{4 \times 70}{\sqrt[3]{0.00000002 \times 1{,}520{,}000}} = 897$$

The quantity of air in circulation under a 3-in. water gage is then

$$Q = X\sqrt{X\ (5.2\ w.g.)} = 897\sqrt{897 \times 5.2 \times 3} = \text{say } 106{,}000\ cu.ft.\ per\ min.$$

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—At a certain mine, the temperature of the inlet is 38 deg. and that of the outlet 62 deg. F.; the mine resistance is equal to 15 lb. per sq.ft. and the atmospheric pressure, 14.7 lb. per sq.in.; the quantity of air entering the mine is 100,000 cu.ft. per min., and the return-air current indicates 4 per cent. of marsh gas. Please state: (a) What quantity of marsh gas is given off in the mine? (b) What is the least amount of decrease of the quantity of air that will render the return current explosive? (c) What increase of gas will render the return air explosive?

Ans.—It is necessary, in this case, to calculate the expansion of the air current in the return airway, due both to the increase of temperature and the decrease of pressure. The expansion of air and gases is directly proportional to the absolute temperature and inversely proportional to the absolute pressure. Hence, the volume ratio is equal to the product of the absolute-temperature ratio and the inverse absolute-pressure ratio. The absolute temperature of the intake is 460 + 38 = 498, and that of the return 460 + 62 = 522. It is necessary, in finding the absolute pressure corresponding to a mine pressure of 15 lb. per sq.ft., to reduce the atmospheric pressure, (14.7 lb. per sq.in.) to pounds per square foot; thus, 14.7 × 144 = 2116.8 lb. per sq.ft. Then, assuming the blowing system of ventilation, the absolute intake pressure is 2116.8 + 15 = 2131.8 lb. per sq.ft.; and the absolute return pressure is the atmospheric pressure, 2116.8 lb. per sq.ft.

The intake current being 100,000 cu.ft. per min. will be expanded on reaching the return airway, as follows:

$$100{,}000\left(\frac{522}{498}\times\frac{2131.8}{2116.8}\right) = \textit{say } 105{,}560 \textit{ cu.ft. per min.}$$

which represents the volume of pure air in the return current. Since the marsh gas forms 4 per cent., the pure air is 100 — 4 = 96 per cent. of the entire current, and the total volume of the return current, air and gas, is, therefore, 105,560 ÷ 0.96 = 109,960 cu.ft. per min.

(a) The quantity of marsh gas given off in the mine is, therefore, 109,960 — 105,560 = 4400 cu.ft. per min.

(b) Assuming that the lower explosive limit of marsh gas is reached when the volume of the air is thirteen times the volume of the gas present, the volume of air in this return current, under the assumed condition, would be 13x4400 = 57,200 cu.ft. per min. The decrease of air in the return current to produce such condition is, therefore, 105,560 — 57,200 = 48,360 cu.ft. per min. This air volume, if measured on the intake entry, must be corrected for decrease of temperature and increase of pressure, which would give 45,810 cu.ft. per min. for the required decrease in the air entering the mine.

(c) Again, assuming that the quantity of gas is increased until the lower explosive limit is reached or until the volume of gas in the return current is $^1/_{13}$ of the volume of air, the quantity of gas then present would be 105,560 ÷ 13 = 8120 cu.ft. per min. The increase of gas to produce this condition would, therefore, be 8120 — 4400 = 3720 cu.ft. per min.

Ques.—Assume that a pair of headings, each 5 ft. high and 8 ft. wide, is being driven to the rise on a grade of 10 per cent. One of these headings is standing, waiting for a crosscut that is almost through. The fireboss reports that the idle heading is filled with gas to within 1 ft. of the bottom at the face. (a) State what quantity of gas is in the heading. (b) How would you proceed to remove the gas with due regard to the safety of the men?

Ans.—(a) The heading being 5 ft. high and the gas filling the heading to within 1 ft. of the bottom at the face, the depth of gas measured down from the roof is 4 ft. at that point. The grade of the heading being 10 per cent., the gas extends a distance of 10 × 4 = 40 ft. back from the face, measured along the roof of the heading. The cross-section of the gas on the line of the heading is, therefore, a triangle having a base of 40 ft. and an altitude of 4 ft.; its area is, therefore, ½ (4 × 40) = 80 sq.ft. The heading being 8 ft. wide, the volume of gas is 8 × 80 = 640 cu.ft.

(b) It may be assumed that the idle heading is the return for the air. All men should be removed from the rooms on this heading and every approach to the heading should be guarded before steps are taken to remove the gas. Beginning at the outby corner of the crosscut, on the return side, a brattice is extended from this corner up the center of the heading toward the face. The work must be done slowly and time must be given for the air current traveling around the end of this brattice to displace the gas and sweep it away. Only safety lamps must be used in the work and frequent tests must be made to ascertain its progress.

Ques.—How many different kinds of gases are commonly met with in coal mines? Name them and give their respective symbols.

Ans.—The common mine gases are four in number, namely, marsh gas (CH_4), carbon dioxide (CO_2); carbon monoxide (CO); hydrogen sulphide (H_2S). Olefiant gas (C_2H_4); and ethane (C_2H_6) are less commonly found in mines.

Ques.—There is a current of 9000 cu.ft. of air passing each minute through a regulator when the size of the opening is 30 in. by 20 in.; how much air will pass if the opening is increased to 30 in. by 30 in., the pressure and rubbing surface remaining the same as before?

Ans.—When the opening in a box regulator is enlarged by sliding back the shutter, the effect is to decrease the mine pressure; and, assuming the power producing ventilation remains constant, the quantity of air passing will be increased, the amount depending on the extent of rubbing surface and the original and enlarged areas of opening. (COAL AGE, Vol. 4, p. 992.)

For a constant pressure, however, the quantity varies as the width of the opening; thus,

$$20 : 30 :: 9000 : x = 13{,}500 \textit{ cu.ft. per min.}$$

Book Reviews

TOPOGRAPHIC AND GEOLOGIC SURVEY OF PENNSYLVANIA, REPORT NO. 6, GRAPHITE DEPOSITS OF PENNSYLVANIA. By Benjamin L. Miller, professor of geology, Lehigh University, 147 pp. 6x9¼ in. 17 pl. Cloth boards.

As this book deals with coals in their final evolution—graphite—we admit it to a brief notice in our columns. It is interesting to note that the graphite from the Raton coal field in New Mexico has roughly 2 to 5 times as much volatile matter, other than moisture, as any of the anthracites from Schuylkill Co. as listed in the Bureau of Mines "Analyses of Coals." We do not propose, however, to draw any rash conclusions from this surprising fact.

AMERICAN RED CROSS ABRIDGED TEXT BOOK ON FIRST AID. Miner's Edition, by Major Charles Lynch, medical corps, U. S. Army, formerly in charge of First Aid Department, American Red Cross, and Lieutenant M. J. Shields, Medical Reserve Corps, U. S. Army. viii + 186 pp. 4¾x7¼ in., 19 full-page plates, 57 cuts. P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia. Paper cover. Price 30c. + 5c postage.

This is a new edition of an old book which has been read by many thousands of first-aid students. The new book is 40 per cent. larger in superficial dimensions than the old, yet it contains even more pages. The change is not in size of type for that remains the same and as the charts used by Doctor M. J. Shields in instruction work are inserted in the text in place of the old space-filling cuts, there is a distinct increase from that cause alone in the amount of information imparted.

The new charts, of which there are 16, are an extremely valuable addition to the book, as are also the 57 illustrations of preventable accidents, reproduced largely from the book published by the Delaware, Lackawanna & Western R.R. Co. coal department and partly from photos made by the Bureau of Mines.

The book illustrates only the Schaefer method of resuscitation but describes both that and the Sylvester system giving the former its proper meed of praise.

COAL-TAR DISTILLATION AND WORKING UP OF TAR PRODUCTS—By Arthur R. Warnes, chemical engineer and technical chemist, XII + 185 pp. 5½x8½ in. 67 ill. John Allan & Co. "The Gas World" offices, 8 Bouverie St., London, E. C. Cloth boards. Price, 7s. 6d., net.

This is essentially a practical book in coal-tar distillation describing the less as well as the more usual distillates and the method of their recovery. Information regarding tar tanks and their construction, how best to minimize the costs of corrosion and its extent, how tar stills may be heated, and other kindred subjects occupy the first six chapters.

Then follow descriptions of plants for the recovery of cresylic and carbolic acids from oils, and details of others for the separation of benzols and napthas and for their rectification. Plants are described for making pyridine from pyridine acid and for the recovery and rectification of pyridine bases, also for the manufacture of crude napthalene and anthracene.

Then follow some notes on the digging or "getting" of pitch which appears to be not without its difficulties. If the workman is not protected with goggles of wire gauze or at least with crêpe, large particles of pitch are apt to fly up from the bed and injure his eyes. Pitch dust causes severe inflammation of the conjunctival membrane and of the cornea of the eye and also ulcerated warty growths turning later to epitheliomatous cancer.

Tar workers' tests are also given showing how to determine the presence of undesirable bodies in the pitch and the character of the byproducts obtained in distillation. An appendix gives the rules of the British Home Office under which tar distilling must be conducted, and the symptoms and the cures for various kinds of gassing in tar workers and others.

SAFETY IN COAL MINES. A textbook of fundamental principles for firemen and other workers in mines, 1912. By Daniel Burns, professor of mining, Royal Technical College, Glasgow. vi + 158 pp. 4½x7 in. 23 ill. D. Van Nostrand Co., New York City. Paper boards with linen back. Price $1.

This admirable little book on mine gases is a handy statement of what a fireboss should know, especially when employed under the new British law. There is little in it which he cannot understand if he will apply himself. However, some parts are marked with a star as a sign that those sections are intended rather for teachers of mining than for firebosses.

How this little book came to masquerade under the title, "Safety in Coal Mines" is hard to imagine, because it only covers a single, and that one of the least numerously fatal causes of accidents in coal mines—gas explosion. In 1911, in Scotland, only 13 deaths were due to that cause out of 186.

But mine air and the consideration of gases in general, leading up to the main subject, forms enough for a small book even when that book does not take into the consideration the dangers of coal dust. Mr. Burns keeps on practical ground. He does not let us learn all about ethane, propane, butane, ethene and what not, which Mr .Burrell says are not in any mine and which we think should not trouble the minds of any fireboss even if the American chemist prove wrong and the European consensus right regarding the presence of ethane.

The book is uptodate and describes Clowe's and Oldham's chambers for testing gas, the Wolf gas-mixing apparatus and that used at the Royal Technical College. This is of value to instructors; and for firebosses, Dr. Haldane's tube is illustrated and Lunge's apparatus for estimation of blackdamp.

Strange to say there are no illustrations or descriptions of safety lamps. While the measurement of ventilation is treated, there is no consideration given to friction and the relative carrying ability of airways. But after all, given a certain lamp which he understands, a mine with currents he is not allowed to modify, perhaps the fireboss has in this book all the information he absolutely needs till he prepares to become a foreman. The book would not qualify him for that position even in the matter of ventilation.

REPORT OF TOPOGRAPHIC AND GEOLOGIC SURVEY COMMISSION OF PENNSYLVANIA 1910-1912. By the Commissioners of the Topographic and Geologic Survey of Pennsylvania. 182 pp. 21 pl. 23 fig. 6x9¼ in. Cloth boards.

The first 49 pages are devoted to administrative detail. The next 80 pages contain a preliminary report of the York Valley limestone belt in York County by M. L. Jandorf. "The Geological Origin of the Freshwater Fauna, of Pennsylvania," by Dr. A. E. Ortman then follows, with an introduction by R. R. Hice.

The most interesting feature in the book to a coal geologist is an article by Lloyd B. Smith on "A Peridotite Dike in Fayette and Greene Counties." The bituminous field of Pennsylvania is remarkably free from every disturbance except folding and erosion. Trifling faults are found all over but with one exception the throws are insignificant. But dikes are unknown in either the bituminous or anthracite regions of the state.

It is interesting therefore that in Fayette and Greene counties, an intrusion of molten matter occurred, which now forms a peridotite dike. These occurrences are common enough in the west, but the only other in the Appalachian coal field known to Mr. Smith, the author of the monograph, is in Elliott County, Kentucky.

The Pennsylvania dike is at least 3¼ miles long and has been studied in the Edenborn and Gates mines of the H. C. Frick Coke Co. It cuts the Waynesburg coal but cannot be found more than 35 ft. above it, in the Waynesburg Sandstone. The dikes run about N 52 W or almost at right angles to the structural folds. Some of the coal near the dyke is coked and 15 ft. away it appears like a semianthracite.

"The most notable effect upon the coal seems to have been in the development of a laminated or platy structure in a zone extending 50 ft. on both sides of the dike. These sheets or laminae are from one to half an inch thick and dip away from the dike at right angles. The ordinary jointing of the coal has been destroyed in the development of the lamination."

The book ends with a tabulation of the "Mineral Production of Pennsylvania." It shows diagrammatically the development in the output of the various "minerals" including natural gas.

It is a sad reflection that in these days when the U. S. Geological Survey sets such an example of excellent draftsmanship, fair type and correct orthography, the geologic publications of Pennsylvania are not as well illustrated, as neatly printed or as carefully edited as in the days of the second Geological Survey of that state.

Coal and Coke News

Washington, D. C.

Representative Ferris, chairman of the House Committee on Public Lands, has offered a bill understood to represent the views of the administration regarding Alaskan public lands valuable for minerals and metals. The new programme is about as follows:

1. A Federal survey of all coal lands in Alaska.
2. Reservation by the Government of 5120 acres of coal land in the Bering River field, and of 7680 acres in the Matanuska field, a total of 12,800 acres.
3. The mining of this reserved Government coal acreage under the President's direction for use in Government works, in constructing and operating the proposed Government owned railroad in Alaska, for use by the navy, and as a check on monopoly.
4. The leasing of all the rest of the unreserved Alaskan coal fields to individuals or corporations on a royalty basis.
5. This unreserved land to be leased in blocks of from 40 to 2560 acres.
6. No person or corporation to be allowed to have any interest in more than 2560 acres under penalty of fine or imprisonment for violation of this prohibition.
7. The royalty for mining from the unreserved Alaskan coal lands to be 2c. per ton, payable monthly, and in addition an annual rental at the rate of 25c. an acre for the first year, 50c. an acre for the second, third, fourth and fifth years, and after that $1 an acre for 20 years.
8. Every 20 years Congress is to readjust the leasing terms and conditions.
9. The income from royalties and rentals to be paid into a special fund for Alaskan development, and particularly for helping pay for the cost of building the Government railroad.

Under the new plan there would be a survey of all the coal lands in Alaska. The lands in the Bering River and Matanuska field are to be surveyed first. Afterward such areas as are tributary to established settlements, or existing or proposed railroads, or water transportation lines, are to be surveyed.

After the survey the President is to designate and reserve from use, location, sale, lease or disposition not more than 5120 acres in the Bering River field, and not more than 7680 acres in the Matanuska field. The bill provides:

That the deposits in said reserved areas may be mined under the direction of the President when in his opinion the coal is required for Government works, or in the construction and operation of Government railroads, or is required by the navy, or is necessary for national protection, or for relief from oppressive conditions brought about through the monopoly of coal.

The Lane plan contemplates that the unreserved coal lands shall be divided into "leasing blocks" or tracts of 40 acres each, or multiples thereof, and in such form as will permit the most economical mining, but in no case exceeding 2560 acres in one leasing block. Then the Secretary of the Interior is to offer these "blocks" of land containing coal, lignite and "associate minerals" for leasing, and award the leases by an advertisement for competitive bidding, to American citizens, or those who have declared their intention to become such citizens, or to any association or corporation organized under American laws.

The royalty and rental clauses of the Lane plan, embraced in the Ferris bill, are as follows:

That for the privilege of mining and extracting and disposing of the coal in the lands covered by his lease the lessee shall pay to the United States such royalties as may be specified in the lease, which shall not be less than 2c. per ton, due and payable at the end of each month succeeding that of the shipment of the coal from the mine, and an annual rental, payable at the beginning of each year, on the lands covered by such lease, at the rate of 25c. per acre for the first, and 50c. per acre for the second, third, fourth and fifth years, and $1 per acre for each and every year thereafter during the continuance of the lease, except that such rental for any year shall be credited against the royalties as they accrue for that year.

The new plan provides a method of obtaining a supply of coal for strictly local and domestic use in Alaska by authorizing the Secretary of the Interior to issue to the applicants a so called "limited license," granting the right to prospect, mine, and dispose of coal belonging to the United States in specified blocks, for not over 10 years, to any person or corporation on such terms not inconsistent with the proposed act as in the Secretary's opinion will safeguard the public interest, without payment of royalty for the coal mined.

The money from the royalties and rentals is to be paid into a special fund subject to disposition by Congress for development of Alaska, but this money is to be particularly subject to application toward the building of the Government railway.

Proposed Switching Charges Are Too High

The Interstate Commerce Commission has handed down a decision in the case of Alexandria vs. switching charges, in which a proposed increase in the switching charges on coal and coke by the Southern Ry. Co. from the Potomac yard, near Alexandria, Va., to Alexandria proper, is found not justified, but a maximum charge of 20c. per net ton established for the future.

The coal in question can reach Alexandria via two routes: One via Richmond, in which event the Southern Ry. has no part of the transportation except this switch movement; the other via Charlottesville, in which the Southern enjoys a main-line haul of considerable length. The real purpose of the increase was probably to divert traffic to the line of the respondent, but that element of the case was not especially presented or considered. There is now on file a tariff charge for the movement of this coal of 11c. per ton, and that charge was to be increased to 35c. The only question for consideration was the reasonableness of the higher rate.

Regulations Concerning the Income Tax

On Feb. 12 the Bureau of Internal Revenue in the Treasury Department issued "Regulations No. 33" in which are included new and extensive provisions with reference to the payment of the income tax by various classes of corporations. Among these are important regulations with regard to the establishment of depreciation by mining companies, a subject that has been under litigation during the past year. It is provided that:

Art. 141. The depreciation of coal, iron, oil, gas, and all other natural deposits must be based upon the actual cost of the properties containing such deposits. In no case shall the annual deduction on this account exceed 5 per cent. of the gross value at the mine (well, etc.) of the output for the year for which the computation is made.

Art. 142. The term "gross value at the mine," as used in paragraphs B and G of Section 2 of the act of Oct. 3, 1913, prescribing a limit to the amount which may be deducted in the return of individuals and corporations as depreciation in the case of mines, is held to mean the market value of ore, coal, crude oil, and gas at the mine or well, where such value is established by actual sales; and in case the market value of the product of the mine or well is established at some place other than at the mine or well, or on the basis of the bullion or metallic value of the ore, then the gross value at the mine is held to be the value of the ore, coal, oil, or gas sold, or of the metal produced, less transportation, reduction, and smelting charges.

If the rate of 5 per cent. per annum shall return to the corporation its capital investment prior to the exhaustion of the deposits, the rate on which the annual deduction for depletion of deposits is based must be lowered in accordance with the estimated number of years it will take to exhaust the estimated reserves.

In case the reserves shall be in excess of the estimates, no further deduction on account of depletion shall be made where the capital investment has been returned to the corporation.

Art. 143. In addition to the deduction to measure the loss due to depletion, the corporation will be allowed the usual depreciation of its machinery, equipment, etc., such depreciation to be determined on the basis of the cost and estimated life of the property with respect to which the depreciation is claimed.

Art. 144. Corporations leasing oil or gas territory shall base their depletion deduction upon the cost of the lease, and not upon the estimated value, in place, of the oil or gas.

Art. 145. Corporations operating mines (including oil or gas wells) upon a royalty basis only cannot claim depreciation because of the exhaustion of the deposits.

Art. 146. Unearned increment will not be considered in fixing the value on which depreciation shall be based.

WILKES-BARRE, PENN.

Further changes in the makeup of the mine examining boards were made by the court of Luzerne County when the mine foreman examining boards for the six districts in the county were appointed. The law requires the boards to consist of one mine inspector, one mine superintendent, and two practical miners. The new appointments leave the first agencies intact, but in four of the six districts new miners are chosen.

The appointments are as follows: District No. 6—Hugh McDonald, inspector; Henry McMillan, superintendent; M. J. Ford and Frank Parks, miners; District No. 7—Thomas J. Williams, inspector; Samuel R. Morgans, superintendent; William Chappelle and Patrick McGrane, miners; District No. 8—S. J. Jennings, inspector; James McCarthy, superintendent; Thomas Grogan and John Evers, miners; District No. 9—D. T. Davis, inspector; H. G. Davis, superintendent; Lewis R. Thomas and George Raub, miners; District No. 10—J. J. Walsh, inspector; F. H. Kohlbraker, superintendent; Frank Kettle and Joseph Dzialowski, miners; District No. 11—D. J. Roderick, inspector; John Turnbach, superintendent; John O'Hara and James North, miners.

Labor Troubles Are Decreasing

Reports received by mine workers in the northern anthracite field are to the effect that labor troubles and strikes in the last six months have been few and far between. Of course, there have been a number of button strikes, but in most instances these were settled within a few hours after the men walked out and were not considered as serious. The number of grievances aired between the miners and the operators is also decreasing, the reports showing that approximately 100 cases have been brought before the board of conciliation since the signing of the last agreement between the workers and operators on May 20, 1912, and 80 per cent. of these have already been settled, compromised or withdrawn.

The board consists of three representatives of the operators and three representatives of the mine workers. Its members hear the testimony, discuss the cases among themselves, and, if possible, decide them by a majority vote. When the members of the board fail to agree, an umpire is called in. Former Commissioner of Labor Charles P. Neill has been called in as umpire in 11 cases since the signing of the last agreement.

The mine workers were sustained in five cases, the decision given to the operators in five, and one case was compromised. In addition to this one decision is pending, and three more cases have recently been referred to the umpire.

Two of the most important recent decisions of the board were that sustaining the claim of the mine workers that they were entitled to receive the benefit of the sliding scale for the month of March, 1912, and the unanimous resolution recommending the discharge of some trouble making mine workers, employees of the G. B. Markle Co.

The mine workers had claimed the right to exclude nonunion members from the mines, in violation of that clause in their agreement which provides for nondiscrimination against union or nonunion men. During the first year of the existing agreement there were many button strikes in order to force the mine workers into the union, but since this decision they have been comparatively scarce.

The nature of the different grievances brought before the board consists of disputes over rates of payment for different kinds of work, claims of altered and more difficult mining conditions, dockage disputes, disputes over the replacing of props, pay for brattice work, and similar claims.

PENNSYLVANIA

Anthracite

Centralia—The Lehigh Valley Coal Co. has taken a lease on the Continental Colliery at Centralia for 15 years, from the Board of City Trusts of Philadelphia, acting under the will of Stephen Girard. The company agrees to pay as royalty to the Girard Estate 20 per cent. of the average selling price per ton for all coal mined in veins more than 4 ft. thick, and 16 per cent. for coal mined in smaller veins. The Lehigh Valley Coal Co. has operated the colliery for several years, and proposes to make big improvements now that a new lease has been secured. The capacity of the colliery is over a thousand tons daily.

Tamaqua—The air current being cut off by a fall of coal in the No. 4 mine of Nesquehoning colliery, two miners who were at work in a manway were suffocated by the black damp. Their bodies were recovered several hours later.

Laurel Run—The first mine cave disturbance in 13 years to visit this borough occurred on Feb. 9. Deep crevices appeared and cellar walls cracked in many places. The central point of the disturbance seemed to be just beyond the Central railroad tracks, about at the starting point of the former auto hill climb course to "Giants' Despair."

Bituminous

Harwick—A verdict of not guilty was returned by the jury on Feb. 13 in the case of Apolinoy Meduski, John Smobodnick, and Basel Goresky, three miners who were accused of dynamiting the fan house of the Allegheny Coal Co. during a recent strike. Only circumstantial evidence could be secured against the men.

Fort Hill—The Ajax Coal Co., on the B. & O. railroad, has resumed operations after being idle for several years.

Bridgeville—The Henderson Coal Co., of Pittsburgh, has commenced the development of a 700-acre coal tract. A shaft is being sunk and houses are being erected for the employees. Estimates are being received for the buildings and equipment for the production of 2000 tons a day. The mine will be electrically operated.

Somerset—The Victor Coal Co., organized by L. G. McCrum, has purchased 1200 acres of coal in Somerset County The coal was purchased from the Haws Coal Co., of Johnstown, and the Smokeless Coal Co. The territory consists of 800 acres of "B" coal and 400 acres of the "C" Prime or "Quemahoning" vein. The present output of the company's mines is about 500 tons per day. This will be increased to 1000 tons as soon as additional equipment can be installed.

Pittsburgh—William H. Downer, president of the Cambria Steel Co., has purchased from J. V. Thompson and associates of Uniontown a large tract of coal land, embracing thousands of acres, underlying 13 farms in Monongahela Township, Greene County. The nominal consideration is given as $1. The tract is reported to be worth $500,000 or more.

WEST VIRGINIA

Charleston—It is unofficially reported that Governor Hatfield has under consideration the calling of a special session of the State Legislature on or about Apr. 1. Among the legislation which the Governor desires enacted during this session in case it is called is a law providing for a production tax of 1c. on every ton of coal mined in West Virginia.

The report of Chief Mine Inspector Earl Henry for the month of Januray showed that deaths among the miners for that month were 38, an increase of 45 per cent. over the same month last year. Most of these fatal accidents were caused by carelessness, due to the many holidays among the foreign miners. Men off duty a few days apparently do not take pains to see that everything is safe.

Colliers—On Feb. 13 James Moore, a striker, was killed in an exchange of shots with Deputy Sheriff Harry Lucas. According to eye witnesses, Moore started the shooting.

ALABAMA

Birmingham—The largest single day's output of coal ever mined by convicts in the State of Alabama was recorded at Banner Mines on Feb. 12, when 1846 tons were put over the tipple at that mine. This not only breaks all previous records in convict mines in Alabama, but is a record output for the Banner Mines, and has seldom been eclipsed by any other mine in the state. Since the completion of the new steel tipple and concrete washer a few months ago, the output has been steadily on the increase and will probably reach the 2000-ton mark within the next few weeks. Banner mine is owned by the Pratt Consolidated Coal Co. but is operated under lease by the State of Alabama. The new tipple and coal washer represent an outlay of about $100,000, it being the most up-to-date plant south of Pittsburgh. J. H. Tidmore is Superintendent of operations for the state, being assisted by W. J. Scott, who has charge of the inside workings.

Ensley—The new hospital of the Tennessee Coal, Iron & R.R. Co. at Ensley, Ala., has been formally opened. Dr. Floyd Nolan is head physician, asisted by Dr. T. C. Watson. Four other physicians and five trained nurses are on the hospital staff. It is one of the most complete industrial hospitals in the South.

KENTUCKY

Frankfort—A bill introduced in the Kentucky Legislature, which proposes to fix a license tax on the mining of coal, on a tonnage basis, has aroused considerable interest, as it is asserted that any further burden on coal operations in the state would result in doing the industry serious injury. If the bill seems likely to pass it is probable that some kind of opposition will be organized among the operators, as they feel that they cannot permit any license tax proposition to go through without a fight.

Whitesburg—The Roberta Coal Co. will shortly begin work on a big coal development at Kona, near the mouth of Boone's Fork. Preparations are being made for the construction of several hundred buildings to accommodate the miners and other workers, and by summer the work is expected to be well advanced.

Sebree—The miners employed in the works of the Sebree Coal & Fuel Co., who went out on strike recently, have returned to work, their grievance against the company having been adjusted.

OHIO

Columbus—Certain members of the Ohio General Assembly have requested Governor Cox to make an exhaustive investigation of alleged discriminatory freight rates with a view of helping Ohio operators who will be damaged by the operation of the mine-run law.

Coshocton—Because of a disagreement over day work, about 100 miners employed by the Morgan Run Coal Co. near Coshocton struck recently. Union officials are trying to settle the difficulty.

INDIANA

Sullivan—The Vandalia Coal Co.'s mines in Sullivan County broke all former records in the amount of coal produced in January, when the shafts turned out 210,000 tons, or 7000 tons more than was ever produced in one month before. The month's production is an average of 30,000 tons to the mine.

The Mammoth Vein Mine, owned by the Monon Coal Co., has been closed.

Carlisle—The Carlisle Coal & Clay Co.'s mine has been sold to the Chicago-Carlisle Coal Co., which will reopen it. Geo. A. Vandyke is president and W. A. Patterson, secretary of the new concern.

Bicknell—Four miles northeast of here, on the Vandalia Road, the new town of Aliceville is taking shape. It is near two mines being put down by the Zeller & McClelland Coal Co., one of which will be the largest and best equipped in the state. The town is named after the heroine in the novel "Alice of Old Vincennes."

ILLINOIS

Marion—The largest strip mine that has ever been worked in southern Illinois is now in full operation northwest of here, where 600 tons of strip coal is loaded daily. It was expected to load out 1000 tons daily by this time, but unexpected earth deposits have retarded the work. McLaren & Honald, it is understood, have an investment of about $75,000 in this operation, producing mine-run coal at about 40 cents per ton. Regular mining costs are about 90c. to $1.

Murphysboro—Investigators have recently finished their work of ascertaining if the Big Muddy river is navigable for coal barges. It is not known what the findings were, but with the opening of the Panama Canal and the new market for coal via the Mississippi River, the proposition of shipping from the Jackson and Franklin County fields via the Big Muddy has been gone into. The first coal actually mined for commercial purposes and shipped from Illinois was in 1810, when it went down the Big Muddy and Mississippi to New Orleans. As late as 1832 records show several boat loads shipped, but since that time there has been no water transportation.

Duquoin—St. Louis capitalists have secured options on 5000 acres of untouched coal land in the western part of Perry County, and are continuing the leasing of the 15,000 adjoining acres. Prospecting for coal will also begin as soon as options are secured on 20,000 acres north of Pinkneyville.

Peoria—Foley & McCullough, proprietors of the Mapleton Coal Co., Mapleton, Ill., have purchased from Dooley Bros., of Peoria, what is known as Eastern Mine in East Peoria. The new proprietors expect to change from a shaft to a slope and put in a complete electrical equipment the coming summer, obtaining power from the Central Illinois Light Co., of Peoria.

KANSAS

Curranville—One man was killed in a dust explosion at Mine No. 1 of the J. R. Burnett Coal & Mining Co., at Curranville, recently. H. D. Mason, Jr., in charge of mine rescue car No. 4, was delivering a lecture when he heard of the explosion. The rescue apparatus was rushed to the mine and a shot-firer was saved. Original reports told of a half dozen men being trapped, but the single casualty reported was the only one of the accident.

OKLAHOMA

Bartlesville—Belief that beds of coal underly the surface in the northern part of Washington County has caused a representative of a big mining concern to lease a large acreage of land. Several thousand acres already have been leased, and options on many more have been secured. Work in the development of mines will start in a short time.

PERSONALS

E. B. Tolle has resigned his position as superintendent of the mines at New Glasford, Ill., and his place has been taken by Bud Carson, of Farmington.

Professor Ray of the college of Mining, Ohio State University, delivered a lecture at the University chapel recently on "The Coal Resources of Ohio and their Exhaustion."

Walter Moore, former alderman from the Fourth Ward, of Birmingham, Ala., and one of the most prominent coal operators of the district has announced his candidacy for the Alabama State Legislature.

William Goddard has recently been appointed general superintendent of all the mines of the Southern Illinois Coal & Coke Co. and W. J. Smith, has been made general sales agent, with headquarters in Chicago.

Patrick Gilday, president of District No. 2, United Mine Workers of America, while at the recent convention in Indianapolis, consulted a specialist and was informed that he was suffering from tumor of the stomach, which will require a speedy operation.

D. H. McGee, who for the last eight years has been general manager of the Buck Ridge Colliery, resigned his position on Feb. 10, to accept the general managership of a number of collieries controlled by Irish Brothers in Pennsylvania and West Virginia.

W. H. Hufstader, resident manager of the Pittsburg & Buffalo Co., at Buffalo, N. Y., has been appointed general manager of the new Jenkins Coal & Coke Co., with headquarters in Cincinnati. He will be succeeded here by Charles A. Sterck, a salesman for the company from this office.

C. C. Collins, who has been sales manager of the Hocking Valley Products Co. has resigned to become general sales agent of the W. J. Hamilton Coal Co. which has offices in the Schultz Bldg., Columbus, Ohio. He takes the place of W. J. Hamilton who withdrew to organize the William J. Hamilton Co. Mr. Collins will take up his new duties about Mar. 1. No successor has been selected by the Hocking Valley Products Company.

T. H. Tinney, for seven years a member of the State Board of Mine Examiners of Alabama, and former foreman at Docina mines, has succeeded W. R. Ray as Inspector in the Fourth District of Alabama, the appointment having been made by Chief State Mine Inspector Nesbitt. Mr. Tinney assumed his new duties on Feb. 1. This leaves a vacancy on the State Board of Mine Inspectors, which will be filled by appointment by Governor O'Neal.

F. M. Thompson has purchased the interest of H. H. Sanderson in the firm of Danford & Sanderson, of Walsenburg, Colo. The new firm will be known as Danford & Thompson, civil and mining engineers, and at present it represents 17 coal-mining companies in the Walesenburg field alone. Mr. Danford is at present acting general manager for the Cedar Hill Coal & Coke Co., and Mr. Thompson has. in the past, been in charge of the engineering work of the Nigger Head Coal Co.

CATALOGS RECEIVED

The Platt Iron Works Co., Dayton, Ohio. Bulletin No. 741, "Triplex Power Pumps." Fifty-one pages, 8½x11 in., illustrating and describing power driven triplex pumps.

The Pawling & Harnischferger Co., Milwaukee, Wis. "Difficult Drilling and Boring Made Easy." Twenty-nine pages, 6x9 in., illustrating and describing P. & H. horizontal drills.

The Marion Steam Shovel Co., Marion, Ohio. "Marion Revolving Shovels." Forty-seven pages, 4½x8¾ in., profusely illustrated, describing the many applications of Marion shovels from sewer digging and street construction to cheap and successful coal mining in the open pit.

CONSTRUCTION NEWS

Logansport, Ind.—The Vandalia R.R. is building a siding on the west side to receive cars of coal for unloading. The company is preparing to store several hundred cars, to provide against strike trouble.

Johnstown, Penn.—Coal developments in the south of Somerset County have been given a considerable impetus during the past month or more by the Hitchman Bros., of Mt. Pleasant. Two openings are there being driven.

Smithfield, Penn.—The first mile has been graded and the ties and rails distributed on the Crozier Run railroad, a branch of the Baltimore & Ohio. The road is being built for

the purpose of developing coal lands of the Republic Iron & Steel Co., and will be about 3 miles long. The branch will open up an immense body of coal.

Bluefield, W. Va.—Everything is in readiness for commencing the actual construction of the Norfolk & Western parallel line to run from Naugatuck through Kentucky to Iaeger, on the Tug River bank, giving more ample railroad facilities to Kentucky coal developments now in operation and those to come on the Kentucky side of the river.

Hammond, Ky.—The Mineral Fuel Co. is rushing work on its new town of Haymond, on Potter's Fork, in Eastern Kentucky, as well as the new town on Yount's Fork, 300 carpenters being added last week. The Nicola Building Co., of Pittsburgh, which has built several good-sized mining towns in that section, has the work in charge at both points.

Martins Ferry, Ohio—Work is rapidly progressing on the Webb mine on the O. R. & W. R.R., and the development will be a model when completed. Coal is being taken from the mine at the rate of about 50 tons a day, which is for the purpose of opening up the entries and passages. The steel railroad tipple is one of the largest in this section of the country. When work is completed, it is the expectation to mine between 300 and 500 tons of coal per day.

Portsmouth, Ohio—Considerable stir in railroad circles was caused recently by the definite announcement that the Chesapeake & Ohio R.R. is to enter Portsmouth and connect with the Norfolk & Western R.R. at that place. Steps are being taken to build a bridge across the Ohio river at Sciotoville, eight miles above the city. In that connection the announcement is made that the Norfolk & Western will build several additional tracks between Columbus and Portsmouth. Attorneys for this road recently appeared before the city council at Portsmouth and asked for permission to build an overhead crossing in bringing about the connection. The Chesapeake & Ohio will build several branches into rich coal fields in eastern Kentucky.

NEW INCORPORATIONS

Terre Haute, Ind.—The Eureka Block Coal Co. has increased its capital stock from $50,000 to $500,000.

Wallsend, Ky.—The Wallsend Mining Co. has been organized by B. F. Howard, E. A. Withrow and Frances Howard The capital stock is $1000.

Providence, Ky.—The Clover Creek Coal Co. has been incorporated with a capital stock of $10,000, by F. V. Ruckman, D. J. Ruckman and E. B. Robinson.

Terre Haute, Ind.—W. S. Boyle & Co., mining operators, have incorporated, with $60,000 capital stock. The directors are W. S. Boyle, C. E. Gilmore, H. A. Stark, J. S. Shinkle.

Columbus, Ohio—The Murray Mining Co. has been organized with a capital of $15,000, for the purpose of mining and dealing in coal. The incorporators are J. C. Yountz, A. R. Jones, S. M. Domly, C. E. Leslie, and Charles E. Nixon.

Accoville, W. Va.—The Ruffner Coal Co. has been organized for the purpose of mining coal, with a capital stock of $25,000. The incorporators are Shirley Ruffner, Martha D. Ruffner, R. G. Ruffner, of Iaeger, W. Va.; C. L. Donevant, of Berwind, W. Va., and W. H. White, of Welch, W. Va.

Charleston, W. Va.—The Ohio-Guyan Coal Co., of Cleveland, Ohio, has been incorporated with a capital stock of $85,000. The chief works will be in Logan County, W. Va., and the incorporators are David E. Evans, S. O. Mathews, F. E. Rook, J. H. Orgill, and J. J. Rowe, all of Cleveland, Ohio.

Paintsville, Ky.—At a recent meeting of capitalists the Kentucky River Consolidated Coal Co., the Haly Coal Co., the Letcher Coal & Coke Co., the Henry Coal & Coke Co., and the Slemp Coal Co. were merged into the Slemp Consolidated Coal Co. with a capital of $2,500,000, and 100,000 acres of the richest coal land in Kentucky is now owned by this firm. The principal operations will be in Letcher, Perry, Leslie, Knott and Breathitt Counties.

Charleston, W. Va.—The King-Pocahontas Coal Co. was incorporated under the laws of West Virginia, Feb. 13. The capital stock is $7,000,000, and the purpose of the firm is to engage in the mining and selling of coal, clay, iron ore, and other minerals, and the manufacture of coke. The incorporators are Lewis Freedman, Albert H. Maurice, Denny B. Murray, William B. Tucker and John Ferguson, Jr., all of New York City. The principal place of business of the corporation will be at Vivian, and its chief works, at that place and elsewhere in McDowell County.

INDUSTRIAL NEWS

Trenton, N. J.—The Federal Grand Jury on Feb. 10 indicted Maurice Rutherford, vice-president and general manager of the Lehigh & Hudson River Ry. Co. on a charge of receiving concessions from the Pennsylvania R.R. in shipping coal in interstate commerce. The first named railroad company was also indicted.

Connellsville, Penn.—A contract has just been placed by an important Virginia blast-furnace interest for 5000 to 6000 tons a month of standard Pocahontas furnace coke at an average price of $2, ovens. Spot coke has been offered and refused at $2.10 ovens, while Wise County coke has been offered at $2 ovens.

Denver, Colo.—Sustaining the findings of the State Railway Commission from which the case was appealed by the railroad, Judge Perry recently ordered a reduction in rates on coal from the northern Colorado fields to Denver. This is a victory for the Consumers' League, which has been fighting for reduced rates since December, 1909.

Uniontown, Penn.—Almost $25,000 was distributed among the employees of the H. C. Frick Coke Co., who are stockholders in the United States Steel Corporation recently. This amount came to the employees owning steel corporation stock as bonuses. About 2000 men principally located in Fayette County received the money.

Portland, Ore.—It is reported here that the Wellington mines, on Vancouver Island, are expected to be ready to ship coal by Mar. 1. The mines have been shut down for nearly a year and much development work will have to be done before they can be placed in operation again. Advices here are to the effect that such development work is now under way.

Columbus, Ohio—Attorneys representing the Hocking Valley Ry. Co., the Chesapeake & Ohio R.R. Co., the Sunday Creek Co. and allied concerns appeared before Ohio state authorities and the Ohio Utilities Commission recently to determine their attitude in the ouster suit pending against the concerns. They claimed that the recent decision of the federal court will be obeyed and there is no necessity for the state suits.

Charleston, W. Va.—The West Virginia mine-rescue car, which is kept at the government station at Huntington, may now be carried free of charge by the railroads of the state without any discrimination against the general public. This is according to a ruling of the Public Service Commission rendered Feb. 13. An order to this effect has been issued following the request of the Director of the Bureau of Mines, at Washington.

Youngstown, Ohio—Any possible interruption of service either in electric railway transportation or power supply that may arise from a shortage of coal has been eliminated by the Consolidated Co. The large accumulations of coal at both the North Avenue and Lowellville plants are on account of the probability of coal mines shutting down about Apr. 1, and the company in order not to take any chances has stored nearly 35,000 tons of coal, or enough to last approximately three months.

St. Louis, Mo.—The proposed decrease in the coal rates from the West Kentucky fields to Chicago, if granted by the Interstate Commerce Commission, will result in a decrease of rates from the same field to St. Louis. The recent organizing of a great company, which will control the west Kentucky situation, is, it is rumored, behind the move to get into the northern and western markets. A large part of this coal being superior to the southern Illinois coal, with the exception of Assumption and Murphysboro, would upset the demand for the latter fuel.

Birmingham, Ala.—Taxes on leasehold interests in coal lands in Bibb County, Alabama, valued by the State Tax Commission at from $3,000,000 to $5,000,000 are at stake in eight appeals from the decision of the Commission, which will be tried in the Circuit Court of Bibb County shortly. Owners of coal land leases contend that they cannot be assessed for their holdings, as the lessees have paid taxes on the fee simple property, or the lands are exempt, being owned by the University of Alabama. The Tax Commission maintains that the leasehold should be assessed separately from the owner's holdings, and that the value of the lease, exclusive of the value of the land itself, is what the Tax Commission is endeavoring to make taxable.

Coal Trade Reviews

General Review

Emergency demands for anthracite in the retail trade as a result of the lower temperatures and slow movement; wholesale market still heavy. Better tone to bituminous prices due to uncertain deliveries, but production restricted and market generally dull.

The severest and most protracted cold of the winter, accompanied by heavy snowfalls, has accelerated the anthracite retail demand and resulted in emergency calls for coal. Retailers usually carry a light stock in an open winter, particularly toward the close of the season, and this, together with the difficulties in making deliveries, due to adverse transportation conditions, has resulted in a moderate activity in retail circles. While this has caused a general stiffening of prices by the individuals, the wholesale end of the business has not been materially benefited. The only anxiety is due to the uncertainty of obtaining prompt movement, and, with this feature eliminated, the coal now held up en route will arrive in such large quantities, that the market will be flooded.

The changed weather conditions have also failed to relieve the bituminous situation, although there is a noticeably better tone to current prices. Operators are showing a commendable disposition to curtail production, and the effects of this move are now becoming evident. Contracts for the new year are still hanging fire; there seems to be a general feeling that there will be plenty of coal, irrespective of whether a suspension occurs or not. The current movement is confined almost entirely to contract business, few spot sales being negotiated.

The severe weather has served to move the demurrage coal in the Pittsburgh district and eliminated the heavier price cutting, although concessions are still obtainable on all grades except on slack. There is still sufficient consignment coal in the market to prevent any general advance in prices and this will probably continue until there are more definite indications of a suspension in April.

The colder weather has enabled the dealers in Ohio to move their stocks. The domestic demand is benefited the most, reports being heard of coal needed in all directions. The combination of colder weather and the failure of the delegates to get together at Philadelphia has had a generally stimulating effect upon the situation. There are many evidences of stocking on the part of railroads, in anticipation of a long shutdown next April. A comparatively large movement over the Hampton Roads piers is reported, but vessel tonnage is becoming scarce, and the demand for spot coal is light, although it is believed that the circular is not being shaded. The cold snap caught the dealers unprepared in the Southern markets, and there has been a sharp rush of orders for immediate delivery, but, with the summer discount now so near, such orders are carefully limited.

A heavy snowfall, accompanied by lower temperatures, and the appearance of a strong buying movement, in anticipation of a suspension in April, has had a reviving influence upon the Middle Western markets. It will take some time yet to clean up all the demurrage coal at different points, but the market is showing a steadily increased strength.

EASTERN MARKET

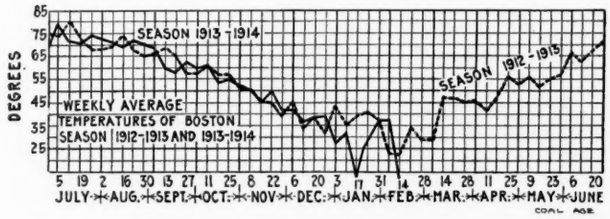
BOSTON

Bituminous is lifeless but a slightly better tone as to prices. Canvassing for contracts continues but with little progress made. Heavy tidewater accumulation of Pennsylvania grades. Anthracite demand improves with cold weather.

Bituminous—There is no life to the soft-coal trade, although the severe weather this week has given a slightly better tone to current prices. Pocahontas and New River are reasonably firm at $2.85 f.o.b. Hampton Roads for spot shipments. There is still a large volume on cars at all the piers, but the rigid curtailment of the last few weeks is beginning to show results. Distress coal has now been pretty well eliminated. Some of the less favorably known grades have been sold at $2.70@2.75, but the tonnage has hardly been significant.

The agencies are still driving hard to close season contracts, but progress is slow. Even with broad talk of a suspension in Pennsylvania, buyers generally in this section are not showing much interest. The feeling is quite pronounced that suspension or not there will be enough coal from one region or another to meet requirements.

"Market cargoes" are now less frequent at distributing points like Boston and Providence and on-car prices are somewhat firmer in consequence. The result of forcing coal on an over-stocked market was so disastrous early in the month that it is hoped the shippers will not repeat the experiment for some time to come.



The heavy accumulation of Pennsylvania coals at tidewater is also a feature of the situation. Orders are scarce and those that come in are for special grades and have no appreciable effect on the market. Some relief is expected from the embargoes that are still in effect on certain of the railroads, applying to shipments of bituminous to tidewater.

Anthracite—There is improvement in the coastwise demand for domestic sizes. The retailers just now have all the business they can handle and are filing requisitions in greater number than at any time since November. Some are even worried, the low temperatures having upset the calculations, based on a mild February. A few weeks ago it was expected the demand would be absolutely flat from this time to the first of April, but it is now apparent that there will be some March business to tide dealers over into the spring shipping season.

Current wholesale quotations on bituminous are:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.95@1.50	$1.25@1.55	$1.67@1.77	
Philadelphia*	2.20@2.75	2.50@2.80	2.92@3.02	
New York*	2.50@3.00	2.80@3.10	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				$2.85
Boston†				3.65@3.83
Providence†				3.63@3.78

*F.o.b. †On cars.

NEW YORK

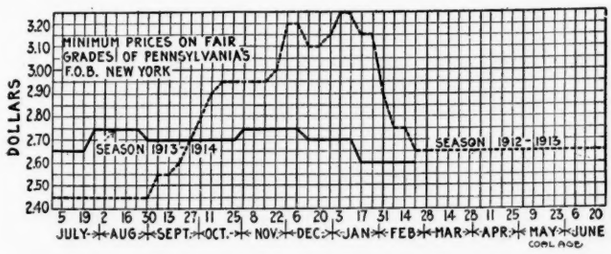
Heavy snowstorms and low temperatures tie up deliveries and cause a temporary flurry in retail circles. Bituminous consumers drawing upon their surpluses. Colder weather helps anthracite agencies to clean up consignment coal.

Bituminous—In spite of a protracted period of severe storms, which at times attained the proportions of a gale, and were accompanied by the lowest temperatures of the winter together with heavy snow falls blockading the streets, and crippling transportation service of all kinds, the local wholesale coal markets have failed to benefit. Considerable activity developed in retail circles in which some uneasiness over the situation is noted due to the difficulty in making deliveries because of the congested condition of the streets.

The movement is, of course, badly delayed both rail and water, while consumption is increased, all of which is having a temporarily stimulating effect upon the situation. Some believe that should the weather continue severe and the trade be called upon to supply a large amount of coal, the situation might even become serious. But it is generally thought that warmer weather will see the release of large tonnages now delayed en route with the result that the market will be flooded. For the moment production is automatically restricted by the storm, but the output would not be at full capacity in any event, and it is even doubtful if all the demurrage coal has been cleaned up yet. No doubt

many of the large consumers are being obliged to draw upon a portion of their surplus stock to tide them over which will cause some new buying when the movement again becomes normal.

Prices in the local market continue relatively weak, on the same basis as last week as follows: West Virginia steam, $2.50@2.60; fair grades Pennsylvania, $2.60@2.70; good grades of Pennsylvania, $2.75@2.80; best Miller Pennsylvania, $3.10@3.15; George's Creek, $3.15@3.25.


MINIMUM PRICES ON FAIR GRADES OF PENNSYLVANIA'S F.O.B. NEW YORK
DOLLARS
SEASON 1913-1914
SEASON 1912-1913
JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE
COAL AGE

Anthracite—The changed weather conditions have failed to help the hard-coal situation as well. A temporary increased demand is noted at the mines, but operations will no doubt continue much curtailed. It is not so much a lack of coal as the inability to make deliveries, due to unfavorable transportation conditions. Coal is frozen in the barges, while there is considerable ice which interfers with the water movement and delays are even more frequent in railroad transportation. In fact deliveries are so slow that outside dealers who have to order several weeks ahead are refusing absolutely to consider purchases now that the spring discount is so near at hand.

As a matter of fact the cold weather has only served to clean up the coal threatened with demurrage. Supplies of the steam sizes still continue to be the shortest and this will be more accentuated with warmer weather as that will mean a further curtailment in production. Stove coal is still relatively long, but the more seasonable weather conditions will put it in a moderately firm position.

The New York market is now quotable on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken	$5.00	$4.60@5.10	$5.05	$4.55@5.05
Egg	5.25	5.25@5.35	5.30	5.10@5.30
Stove	5.25	5.20@5.35	5.30	5.15@5.30
Chestnut	5.50	5.45@5.55	5.55	5.35@5.55
Pea	3.50	3.60	3.50	3.30@3.55
Buckwheat	2.75	2.75	2.70@3.45	2.35@2.70
Rice	2.25	2.25@2.35	1.95@2.20	1.90@2.20
Barley	1.75	1.75@1.85	1.70	1.60@1.70

PHILADELPHIA

Retail market active under continued winter conditions. Wholesale trade reflecting the change, but tidewater business shows no signs of immediate improvement. All sizes being moved off at circular. Bituminous not responsive to present weather conditions.

The anthracite trade experienced renewed activities the last of the previous week, and early this week, due to the seasonable weather and heavy snows. Retailers generally have been busy filling orders, for it is a well known fact that many householders, in the face of an open winter, will run close in the matter of supplies, although the advent of anything like wintry weather, will cause rush orders. The wholesale market has not as yet received the impetus naturally to be expected in the face of present conditions; dealers are believed to be all well supplied, so as a rule, partial suspension is still practiced.

The weather has had the effect of stiffening prices of the individual operators, who are ever ready to take advantage of such opportunities as are now offered. There is no call for premium coal, however, and it would not be surprising if some of the poorer grades are still being offered at concessions. Notwithstanding the zero weather in New England, it is understood that there has been no particular haste to place orders on the part of tidewater dealers. This is evidence that New England is well supplied. If the present weather continues for any length of time, the trade looks for a more than active March, which is generally characterized by a listless market.

The bituminous situation has not profited materially from the cold snap. The embargo on shipments to tidewater points still continues, and will probably not be relieved until the accumulation has been disposed of. There is a great deal of surplus coal on hand, while demurrage is accumulating rapidly, and prices quoted will hardly net the operator the cost of production.

BALTIMORE

Anthracite considerably benefited by first severe winter weather. Bituminous market flat despite restrictions incident to heavy snowfall. Tidewater movement normal, and chartering light.

The first real severe weather of the winter accompanied by two falls of snow has created a welcome activity in anthracite. While not up to what it should be even now, there is an increased demand generally for hard coal. Emergency household calls are a feature, and as delivery is made slow by the slippery condition of the streets, coal men are kept busy.

Restriction of delivery, due to heavy snowfall in the mining regions, and the arrival of coal frozen solidly in cars, added to the troubles of the coal men. Loadings at the piers were thus hampered. Small sized anthracite is scarcer in some yards the past week than at any time this winter.

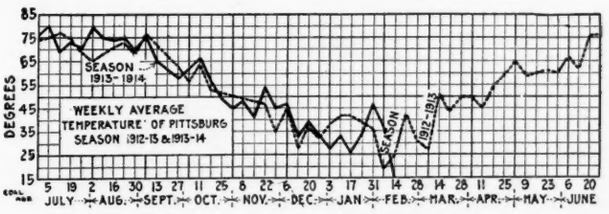
The cold weather had little or no effect on the soft-coal market. Both gas and steam coals are weak. In some mining centers of West Virginia, gas coals are offering dangerously close to actual production cost. The steam fuels are a little stronger. Tidewater movement just now is only medium. Shipments north are confined practically to contract coal. Few charters of importance were announced during the past week.

CENTRAL STATES

PITTSBURGH, PENN.

Consignment coal about cleaned up and prices on a firmer basis. Mine operations much restricted. Increased coke consumption and prices notably stiffer.

Bituminous—The cold weather of the past week has not greatly increased the demand for coal from mines as there was a great deal of fuel on track. Much of this has been absorbed, and heavy cut prices, made to avoid demurrage, have been eliminated although they are still being cut on regular sales for prompt shipment, except in the case of slack, which usually commands $1 to $1.10 against the circular price of 90c. Mine operations continue at about 50% capacity. The cold weather has hampered railroad movement somewhat, but shipments were so light that no serious inconvenience to the mines has resulted. Circular prices remain as follows: Slack, 90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in. steam, $1.50; 1¼-in. domestic, $1.55, per ton at mine, Pittsburgh district.


DEGREES
SEASON 1913-1914
WEEKLY AVERAGE TEMPERATURE OF PITTSBURG SEASON 1912-13 & 1913-14
SEASON 1912-1913
JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE
COAL AGE

The four-state conference at Philadelphia on the wage scale for the biennial period is accomplishing nothing, nor are any tangible results expected at this time. The convention assembled Feb. 10 and after a week or two more of talk will probably recess for a fortnight leaving discussion to a sub-committee. Predictions are frequently made of a settlement by Apr. 1, but this is doubtful. The Pittsburgh district operators intend to resist to the uttermost the proposition of payment on a min-run basis, as their large lake trade, shipping ¾-in. coal makes that method of payment altogether unattractive.

Connellsville Coke—The market has stiffened. Following the withdrawal of the $2 quotation, for shipment after Apr. 1, by the Produces Coke Co. and several outsiders, there have been two sales made for such delivery involving round tonnages, one at $2.10 and one at a slightly higher figure. The requirements of both buyers are somewhat special, however, and there is still $2 coke available. Prompt is in poor request and still quotable nominally at $1.90. There has been a considerable increase in consumption in the past few weeks, but almost wholly on the part of the producer-consumer class. Idle merchant furnaces show no disposition to blow in as yet. We quote: Prompt furnace, $1.90; contract furnace, $2@2.10, prompt foundry, $2.40@2.60; contract foundry, $2.40@2.60, per ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville regions in the week ended Feb. 7 at 304,975 tons, an increase of 3920 tons, and shipments at 303,852 tons, an increase of 5311 tons.

BUFFALO

Seasonable weather, but too much bituminous coal on hand. Anthracite active, with dealers anxious about the future. Not much stir in coke.

Bituminous—There has been any amount of coal weather of late, but it has not been possible to urge the bituminous trade forward much. The railroads are stocking up so that there will be at least a month's supply against the expected shutdown in April, although it does not look as though there would be any great suspension. Operators are now saying that they intend to force a shutdown, but that plan seldom works, as there is always a mine with some customer to be taken care of with the result that all the mines are soon running and coal is selling at cost, as usual. There is no assured way to reduce the output of bituminous coal except by a strike or a car shortage.

Bituminous quotations remain weak on the basis of $2.80 for Pittsburgh lump, $2.70 for three-quarter, $2.55 for mine-run and $2.15 for slack, with Allegheny Valley coal about 25c. lower.

Coke—There is no improvement in the coke trade. The demand is still light and the iron output has not increased enough to warrant asking any advance in prices. The quotations remain on a basis of $4.50 for best Connellsville foundry.

Antaracite—There has been a big increase in business on all sizes of anthracite since the zero weather set in, some shippers and dealers reporting a demand they could hardly satisfy. Should wintry conditions continue there will be a good trade till the final falling off previous to the April prices. If rainy weather returns the demand will drop off again and will not continue long in any event. The loading of anthracite into lake vessels has stopped, as none of the shippers have any surplus, and there will be none till the cold-weather demand drops off.

TORONTO, CAN.

Greatly increased activity due to changed weather conditions. Soft coal for manufacturing purposes rather slow. Proposed municipal coal yard.

Trade has been active for the last week, dealers being overwhelmed with orders, since the extremely cold weather. A noticeable feature of the season's trade is the large number of small orders, indicating that many are unable to buy in excess of immediate requirements owing to the financial stringency. Sales of bituminous for factory purposes continue below normal, owing to plants being closed down or only partially operated. Deliveries by rail have in some cases been delayed on account of weather conditions.

CLEVELAND

A week of cold weather increased the demand for both domestic and factory coal. Outside markets higher, with the result coal was not dumped on the Cleveland market so liberally as it has been.

The cold weather that struck Ohio a week ago lifted the coal trade out of an uncomfortable situation. Since navigation closed coal has been dumped on the Cleveland market but the weather and the surplus made it a poor dumping ground. Not only has the demand from other districts increased, but the other markets offer more for the same product. Reports from small cities close to Cleveland were that coal was needed and as these are not used as consigning places they feel the effects of the changed conditions quickly.

The domestic trade derived the most benefit from the changed weather. There is some demand for hard coal and shading of prices seems to have stopped. Some of the companies are longer on orders for prepared sizes than they have been for weeks. Railroads are giving more attention to stocking. The Pennsylvania has increased its fuel orders from 75 to 100% the last week. Railroads are also sending their own cars to the mines. By doing this they are able to avoid paying car service and can hold the coal on their own sidings against a suspension.

Inquiries for coal to be stocked in factory yards are a little more plentiful. While considerable stocking has been done, some plants having a month's supply ahead, there is going to be a good deal more of it from now on. The miners and operators are not making much headway and the cold weather has emphasized these facts.

Pocahontas operators are quoting into the next coal year and say they have practically sold some large contracts. The larger companies claim they are holding to the following prices: All-rail at the mines on a $1.35 rail freight to this territory, lump and egg, April, $1.60; May $1.70; June, $1.90; July, $2; and thereafter, $2.25. Slack and mine-run are being held at $1.25 f.o.b. mines throughout the year. For lake shipment lump is being quoted at $1.55 to July 1 and $1.65 to the close of navigation; egg, $1.65 to July 1 and $1.75 to the close; mine-run and slack $1.25 through the entire season.

Reports from the upper lake docks state that prepared sizes of domestic coals will be all disposed of by the opening of navigation. For steam purposes the stocks are more than ample and indications are that there will be enough coal at the opening of navigation to take care of the trade through a 60-day suspension.

Sales were made last week at the following prices:

	Pocahontas	No. 8	Middle District
Lump and egg	$3.60	.....	.....
Lump, 1¼ in.	.....	$2.05@2.15	$2.00@2.10
Lump, ¾ in.	.....	1.95@2.00	1.90@2.00
Mine-run	2.60@2.70	1.90@1.95	1.80@1.85
Nut	.....	1.90@2.00	1.85@1.90
Slack	.....	1.80@1.90	1.80@1.85

COLUMBUS

Cold weather stimulates the coal trade to an appreciable extent. Better demand for both domestic and steam grades and quotations steady, but still considerable cheap coal on the market. Predictions of a suspension at the mines.

More strength developed in the Ohio market due to the lower temperatures. The cold weather enabled dealers to move some of their stocks, but it will require a long cold spell to clean up the market and little hope of higher prices is held out. The tone of the trade shows marked improvement all along the line.

The best feature of the market is the demand from dealers for small lots to replenish stocks, but their supply is still large and orders from that source have been generally small. There is still a lot of cheap West Virginia coal offered as a large tonnage was sent in here on consignment.

There is also more strength in the steam grades as is shown by larger orders. Inquiries for stocking have also been received, followed, in some cases, by orders. As previously pointed out users of steam grades have been receiving their regular tonnage which they have not been consuming and thus many have a surplus on hand. Railroads are also taking a larger tonnage and several have stored heavily to guard against a suspension. The Toledo & Ohio Central has 25,000 tons stored at Thurston, Ohio.

The output in Ohio fields increased under the stimulus of increased demand. Reports from the Hocking Valley show that about 55 to 60% of normal was produced and in the Pomeroy Bend district it was as high as 75% of the average. In eastern Ohio the production is estimated at 50% and the domestic fields report about the same. One of the features of the trade is the demand for the fine sizes which are stronger than any other grade, due to the fact that less than ordinary is being produced at this time.

Quotations in the Ohio fields are as follows:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump	$1.40 @ 1.35	.....	$1.50 @ 1.45	$1.40@ 1.35
3-4 inch	1.25 @ 1.20	$1.20 @ 1.15	1.35 @ 1.30	1.30 @ 1.25
Nut	1.25 @ 1.20	.....	1.30 @ 1.25	1.20 @ 1.15
Mine-run	1.10 @ 1.05	1.10 @ 1.05	1.15 @ 1.10	1.10 @ 1.05
Nut, pea and slack	0.85 @ 0.80	.....	0.85 @ 0.80	0.85 @ 0.80
Coarse slack	0.75 @ 0.70	0.95 @ 0.90	0.75 @ 0.70	0.75 @ 0.70

DETROIT

More seasonable weather has firmed up the market. Demurrage coal has entirely disappeared and prices are showing an advancing tendency. Hard-coal consumption up to the maximum for the winter.

Bituminous—The changed weather conditions have materially helped the coal trade, and the situation is much improved with prices advancing, but not up to the circular as yet. On many sizes the market is almost bare, and dealers are buying among themselves in order to meet their obligations. There has been an abrupt reversal of form in the smokeless market, a shortage now being evident with occasional sales as high as 25c., and even up to 35c. above the circular, being reported.

Anthracite—The hard-coal situation has not changed materially, but consumption is now at the maximum for the winter. Sales are showing a decrease due to the natural tendency to curtail buying with the approach of the April circular. Circular prices are well maintained.

Coke—Demand is relatively light but prices steady. The market is quotable as follows: Connellsville furnace, $1.90; egg, $2; Semet Solvay, $3@3.10 and gas house, $2.40@2.65, all f.o.b. ovens.

HAMPTON ROADS

Shipments heavy early in the week but slow toward the end. Prices stationary. Demand for spot coal light.

The first half of the week saw a fairly large movement over all Hampton Roads piers, but vessel tonnage gradually fell off until at the end there was only a small quantity of bottoms in port. The demand for spot coal continues light, although a few sales have been reported. It has been impossible to ascertain, however, at what price these were made; it is not believed that there has been any cut in price.

In addition to New River and Pocahontas moving coastwise there has been some small shipments of high volatile going to the New England market. Government colliers to take in the neighborhood of 20,000 tons from Lamberts Point were declared for loading during this week. These loadings are on regular government contracts.

Cold weather with rain and snow has caused a fair demand for domestic coal, but this demand is of little assistance to the wholesale dealers as practically all retail yards are well supplied at this time.

Foreign shipments have been to Canal Zone, Vera Cruz, Trinidad, Havana, Naples, Venice Manos and Para.

LOUISVILLE, KY.

Severe winter weather stimulates retail business but fails to help the wholesale. Operations much restricted and low prices still prevail.

Nearly a week of snow and sleet, with low temperatures, has given the retailers a chance to unload excess stocks. This activity has not yet been reflected in the wholesale end, however, and difficulty is experienced in disposing of the coal mined on two or three days a week, which is about the limit of activity in most sections of the state. It is hoped that with a continuance of the present severe weather, the retailers may find it advisable to take advantage of the low prices to lay in additional supplies.

The wintry weather has come too late to make up for the prolonged period of summer-like conditions which marked December and January; and while the retailers are profiting by the change, it is unlikely that any noticeable effect will be felt by the operators or wholesalers. Quotations on the better grades of Eastern Kentucky coal are $1.50 and $1.65 for block, $1.30 and $1.40 for round, and $1 for straight run-of-mine, with 90c. for No. 2 run-of-mine and 85c. for nut and slack, the latter growing stronger. Western Kentucky coal can be had at something like 25c. a ton lower all around, although nut and slack is apparently on the up grade, with better prices in sight.

SOUTHERN AND MIDDLE-WESTERN

BIRMINGHAM

Steam and domestic coal show some improvement with blacksmith normal. Furnace and foundry coke quiet. Large sales of pig iron. Car supply satisfactory.

With the temperature around freezing, the lump-coal market has shown quite an improvement, as practically all of the yards had little stock on hand, and the cold snap caught them unprepared, causing an avalanche of rush orders. It is probable that only a small amount in excess of immediate requirements will be ordered as the spring prices go into effect shortly. Prices are slightly advanced over what they were ten days ago.

For some reason, the market on steam coal, following that of the lump, has improved to some extent though some of the contracts with large consumers have been cut to the minimum. Taking it as a whole, the business is better than at any time within the past 30 days. Blacksmith coal continues to move in about its normal tonnage, with no change in prices. Both furnace and foundry coke are quiet, and no immediate improvement is looked for in that line.

NEW ORLEANS

Cold weather stimulates business. Some shipping by all-water route.

Cold weather, which prevailed during the entire week, stimulated business, but total sales are under normal. Some railroad buying is in progress, but the business is on a hand-to-mouth basis. Shipping was heavy last week and the call for coal in the harbor district was larger than has been the case for some time. Steam plants made no purchases during the week and little business is expected from this quarter until summer.

Supplies of coal from the Alabama field have been curtailed. The companies dealing in the up-river coals have placed normal orders for delivery on the spring rise. Lower prices have induced some buying from the steam plants in the Central American countries, but have failed to stimulate any business in this territory. Despite the crowded condition of the yards and storage bunkers, the coal arriving is being unloaded promptly or reconsigned to Texas points.

Tonnage dues on coal, which have been collected at several of the Honduran ports have been canceled. This is expected to result in a considerable increase in the parcel-coal movement from this port.

INDIANAPOLIS

Winter weather continues and retail yards are nearly swamped and ready to buy again. Big users of steam grades storing. Operators have plenty of orders and could put mines on full schedule, if storms were not interfering with the movement.

The sleet and snow storm of a week ago has been followed by weather ranging from zero to 15° above which has lasted another week or more. This has enabled the retail yards to clean up and put them in the ranks of buyers again. Orders have been pouring in, not only on that account but because a peaceful wage settlement between operators and miners is not as promising as it was. This has caused the railroads, public utilities and other large users to stock up and they are as urgent in their demand for steam grades as retailers are for the domestics.

While the cold weather has thus increased the mining, it has also interfered with transportation and especially with the movement at the mines where the cars and equipment are "froze up." A continuation of such weather is going to put prices higher. While they are still where they have been for months, no bargains are to be had. There is opportunity for them to put the mines on full running time, if cars can be obtained and handled satisfactorily.

The industrial situation continues to improve slowly but surely and the weather has caused a greater consumption of coal by factories. All the retail yards have been swamped and there has been considerable transferring of orders between yards in an effort to satisfy the urgent demand. At present the mines are being operated about four days a week.

CHICAGO

Temperatures approaching the zero mark have resulted in increased consumption and augmented sales of coal in the Chicago market. Householders have not only bought for immediate needs, but have laid in stocks for future use.

Certain kinds of coal are still on demurrage and it will take several more days of cold weather to clean up this supply. The market for anthracite coal has been strengthened as a result of a heavier buying movement. Hocking is reasonably firm chiefly as a result of a marked curtailment in production. A good volume of business is being transacted at $1.50 a ton. Practically all splint coal, which has been on track in open cars, has been absorbed and prices range between $1 and $1.50 a ton. Franklin County operators report a revival in business. The market for domestic sizes can be quoted at $1.60 a ton with a few sales at $1.75. The cold weather also has affected prices for Carterville coal, domestic sizes now selling at from $1.50 to $1.60.

A marked improvement has been noted in the steam trade, screenings having been marked up 5c. a ton. Coke prices have not been affected by the cold weather as there was an exceptionally large amount of unsold coke on tracks when the lower temperatures arrived.

Prevailing prices in Chicago are:

	Springfield	Franklin Co.	Clinton	W.Va.
Domestic lump	$2.07@2.17	$2.55@2.65	$2.12@2.27	
Steam lump	1.97		1.97	
Egg		2.55@2.65		$3.90@4.30
Mine-run	1.87	2.20@2.25	1.87	3.20@3.45
Screenings	1.37@1.47	1.75@1.85	1.37@1.47	

Coke—Connellsville, $5.25@5.50; Wise County, $5@5.25; by-product, egg and stove, $4.90; byproduct, nut, $4.75; gas house, $4.50.

ST. LOUIS

Heavy snows and low temperatures create an active market. General price advance all along the line. Strike scare causing some apprehension.

The long looked for improvement in local conditions has arrived; at least temporarily. Fifteen inches of snow the latter part of last week brought railroad traffic to a standstill as far as the movement of coal was concerned, and the low temperature that accompanied the snow caused a demand that started prices upward. As to whether they will continue so depends entirely upon how the public interprets the results of the joint conference at Philadelphia.

Some 900 cars of railroad coal were purchased last week, and there are a few inquiries for orders to be placed this week. In addition to this, several steam plants are slowly but surely accumulating a pile of storage coal and this has already caused a somewhat unwarranted advance in the price of screenings. If this storage proposition takes hold firmly, Carterville will in the next two weeks advance from 25 to 50c. per ton on the screened sizes, and Standard coal from

15 to 30c. a ton. Everything indicates that storage coal will be bought and that means good prices from this time on.

On Eastern fuels, such as anthracite, smokeless and coke, there is absolutely no demand and will not likely be any for some time. Railroads find themselves short of coal cars in the Illinois fields, and traffic conditions are extraordinarily slow and have been for the last ten days.

The market is now quotable as follows:

	Carterville and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump	.....	.....	.....	$1.05@1.10	$1.15
3-in. lump	.....	.....	$1.40	.....	.....
6-in. lump	$1.25@1.50	.....	1.50	1.25@1.35	1.25
Lump and egg	1.85@2.15	2.15	.....	.....	1.15
No. 1 nut	1.20@1.40	.....	.....	.....	.....
Screenings	0.75@0.80	.....	.....	0.55@0.60	0.60@0.65
Mine-run	1.10@1.20	.....	.....	.....	.....
No. 1 washed nut	1.50@1.60	2.25	1.50	.....	.....
No. 2 washed nut	1.25@1.35	.....	1.25	.....	.....
No. 3 washed nut	1.25@1.30	.....	.....	.....	.....
No. 4 washed nut	1.25@1.30	.....	.....	.....	.....
No. 5 washed nut	0.75@0.80	.....	.....	.....	.....

OGDEN, UTAH

Colder weather has stimulated demand for lump coal. Surplus or nut coal at mines causing a suspension of operations. Market conditions weak in California due to warmer weather. Quotation on lump coal consigned to Nebraska reduced 25c. per ton.

Colder weather has prevailed for the past ten days and the demand for lump coal has improved somewhat. Some of the mines are a little behind with orders for this grade due to the colder weather and restricted operations. During February the operators have experienced much difficulty in disposing of the nut coal and have been compelled to restrict operation; consequently the production of lump has diminished and this in connection with the increased demand has caused them to fall behind in shipments.

From California comes reports that the rains of the past two weeks have ceased and warmer weather is general throughout the state. All dealers are well stocked and endeavoring to move the coal on hand before summer weather arrives. No doubt shipments to this territory will be small until the storage period arrives. During the next six weeks the mines will pass through their most trying period of the year. It will be characterized by spasmodic demand for lump coal depending entirely on weather conditions and the amount on the retail market and a continual forcing of the nut market. At the end of this period the demand for nut coal will increase and the market for lump will be on a summer basis.

Quotations remain steady except for shipments to Nebraska and California and are as follows:

	California	Nebraska	General
Lump	$3.00	$2.75	$2.75
Nut	2.25	2.00	2.25
Mine-run	1.85	1.75	1.85
Slack	1.00	1.00	1.00

PORTLAND, ORE.

Unseasonable weather and market continues dull.

The demand for coal for domestic purposes continues light, owing to the open winter all over the Pacific Northwest and the quantity consumed this winter has been less than on the average, excepting that coal has been introduced to customers that have used wood; this latter is gradually becoming more scarce and higher in price and coal is taking its place. The coal in the biggest demand here now is from the Utah mines.

PRODUCTION AND TRANSPORTATION STATISTICS

NORFOLK & WESTERN RY.

The following is a statement of the commercial and company coal handled over this road in January of this year and last year, in short tons:

Field	1913 Commercial	1913 Company	1912 Commercial	1912 Company
Pocahontas	944,063	95,037	1,216,218	124,213
Tug River	182,264	49,578	158,209	37,708
Thacker	161,962	99,186	217,555	66,407
Kenova	66,489	14,991	72,573	11,418
Clinch Valley	165,079	5,056	156,189	9,384
Other N. & W. Territory	5,823	.....	.....	.....
Total N. & W.	1,525,680	263,848	1,820,744	249,130
Wil. & P. Crk. R. R.	41,540	22,130	.....	.....
Other roads	112,616	.....	.....	.....
Grand total	1,679,836	285,978	.....	.....

VIRGINIAN RAILWAY

The total shipments of coal over this road for December, 1913, were 364,937 tons as compared with 317,405 tons for the same month last year. For the year 1913, the shipments were 4,555,331 tons as compared with 3,494,648 tons in 1912.

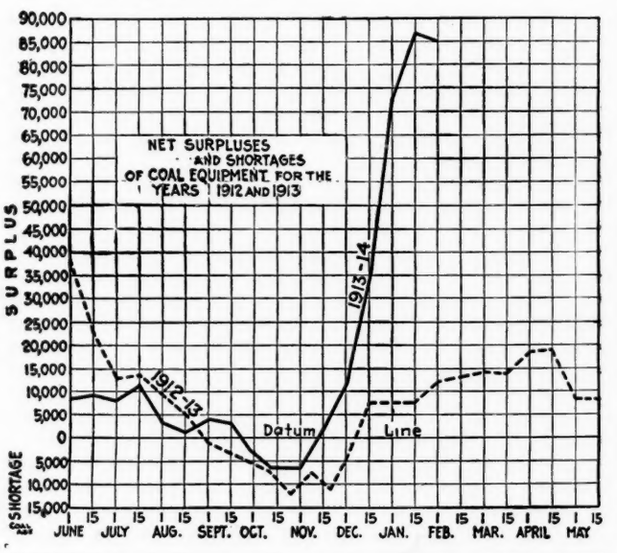
THE CAR SITUATION

American Ry. Association reports surpluses and shortages of coal equipment for two weeks ended Feb. 1, as follows:

	Surplus	Shortage	Net*
New England Lines	1,885	0	1,885
N. Y.; New Jersey, Del.; Maryland; Eastern Penn.	16,591	0	16,591
Ohio; Indiana; Michigan; Western Pennsylvania	41,702	0	41,702
West Virginia, Virginia, North & South Carolina	4,614	15	4,599
Kentucky, Tenn.; Miss.; Alabama, Georgia, Florida	7,353	65	7,288
Iowa, Illinois, Wis., Minn.; North & South Dakota	4,298	14	4,284
Montana, Wyoming, Nebraska	1,235	0	1,235
Kansas, Colorado, Missouri, Arkansas, Oklahoma	3,078	0	3,078
Texas, Louisiana, New Mexico	376	0	376
Oregon, Idaho, California, Arizona	4,357	8	4,349
Canadian Lines	0	0	0
Total	85,489	102	85,387

	Oct. 1	Oct. 15	Nov. 1	Nov. 15	Dec. 1	Dec. 15	Jan. 1	Jan. 15
Surplus	7,953	6,014	6,720	10,520	17,621	36,435	72,535	87,149
Shortage	10,393	12,502	12,595	8,477	5,095	2,295	57	789
Net*	2,440	6,488	5,875	**2,043**	**12,526**	**34,140**	**72,478**	**86,360**

*Bold face type indicates a surplus.


NET SURPLUSES AND SHORTAGES OF COAL EQUIPMENT FOR THE YEARS 1912 AND 1913
SURPLUS
SHORTAGE
1913-14
1912-13
Datum Line
JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY

COAL SECURITIES

William J. Hoey reports the market on various coal securities for the week ending Feb. 14, as follows:

Stock	Bid	Asked	Stock	Bid	Asked
American Coal	80	100	Jef. & Cle'fd. C. & I. Pfd.	75	85
American Coal Products	83	84	Kentucky Block Cannel	40	60
Amer. Coal Prod. Pfd.	104	106	Lehigh Valley Coal Sales	185	195
Big Muddy Coal & Iron	75	100	Leh. & Wilkes-Bar. C. Co.	300	350
Burns Bros.	50	53	Mahoning Coal R. R.	700	750
Burns Bros. Pfd.	94	99	Mahoning Investment	68	78
By-Products Coke	112	116	Maryland Coal of Md.	3	6
Central Coal & Coke	80	86	Maryland Coal of W. Va.	7	9
Central Coal & Coke Pfd.	78	86	Maryland Coal of W. Va. (5% Bonds)	54	62
Chicago Lumber & Coal	50	56	Midland Coal	80	90
Chicago Wil. & Ver. Coal	25	32	N. Y. S. & W. C. Pfd.	15	30
Colo. Fuel & Iron Pfd.	150	160	Pocahontas Con. Collieries	92	101
Cumberland Corporation	10	14	Pocahontas Con. Coll. Pfd.	98	105
Cumberland Corp. Pfd.	39	44	Texas & Pacific Coal	97	101
Del. Lack. & West. Coal	260	270	Unite Coal of Pittsburgh	3	101
Elkhorn Fuel	4	10	Victoria Coal & Coke Pfd.	40	80
Elkhorn Fuel Pfd.	55	70			
Hocking Valley Products	1	4			

Bonds	Bid	Asked	Bonds	Bid	Asked
By-Prod. Coke, 6's, 1930	100	102	New Riv. (Coal) 1st, 5's, 1951	96	99
Carnegie Coal, 5's, 1917	98	101	Pleas. Val. C., 1st, 5's, 1934	75	83
Consol. Coal, Conv., 6's, 1923	100	102	Pocah. Collieries, 5's, 1928	88	92
Consol. Coal, Ref. 5's, 1950	88½	91	Pocah. Con. Coll., 5's, 1937	94	99
Cumberland Corp., 6's, 1915	97	99	Solvay Collieries, 5's, 1957	85	87
Erie-Pa. C. Col. Trust, 4's, 1951	90	91½	Sunday Creek Co., 5½'s, 1931	96	99
Fairmont Coal, 5's, 1931	93	96	Vic. Am. F. 1st, 5's, 1944	58	64
Lack. Coal & Lum., 6's, 1961	57	59	Ref. S. F., 6's, 1940	90	100
Monongа. Riv. C., 5's, 1945	92	95	Vic. Fuel 1st S. F., 5's, 1953	75	90
N. Mex. Ry. & Coal, 5's, 1947	96	99	Webster C. & C. 1st, 5's, 1942	79	84

DIVIDENDS

American Coal—Dividend of 3% payable Mar. 2 to holders of record, Feb. 28.